Version Release Date: 12/27/07

SEVERE WARNING:
Automotive water-to-energy technology is not a toy! **Read this manual completely before attempting to use any part of this technology!**
We will not be liable for any damages or violations of applicable law.

SEVERE WARNING:
Electrolysis of water generates explosive gas!!! NEVER try to light a match in front of the Electrolyzer's output - the device WILL explode!

www.Water4Gas.com **Presents:**

water4gas

HOW TO SAVE TONS OF FUEL

With Your Hydrogen-On-Demand System

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TABLE OF CONTENTS

ACKNOWLEDGMENT.....6

LEGAL DISCLAIMER.....7

THIS BOOK IS PROVIDED FOR INFORMATION PURPOSES ONLY.....7
INFLICT CHANGE.....7

WHO CAN YOU BENEFIT MOST FROM THIS BOOK.....8

THIS BOOK IS NOT FOR "NORMAL" DRIVERS.....8
WHAT is GST?.....9
HOW TO GET THE BEST POSSIBLE MPG.....9
DESCRIPTION OF THE 305 MPG PHOTO.....9
HOW COME THIS IS NOT PART OF NORMAL CAR TECHNOLOGY?.....11
WATCH THIS 8-VIDEO SERIES BEFORE THEY DISAPPEAR.....13

INDIVIDUAL EFFECTS ESTIMATED.....14

GENERAL.....14
OPTIMAL SYNERGISTIC EFFECTS.....15
KEEP YOUR EXPECTATION WITHIN REASON.....15
GOOD MECHANICAL SHAPE.....15
YOU THE DRIVER.....15
ELECTROLYZER 16
CARB AND TIMING 16
FUEL HEATER 16
PCV ENHANCER.....17
SYNTHETIC MOTOR OIL.....17
XYLENE.....17
TIRE PRESSURE.....17
BUT WAIT, THERE'S MORE!.....17
BUT WAIT, THERE'S ALSO LESS.....18
ONLY THE BEST.....19

GST #0: FIX IT FIRST!.....20

GST #0A: FIX THE VEHICLE.....20
GST #0B: FIX THE SYSTEM.....21

GST #1: DON'T MOVE!.....22

THE COMMAND OF STOP.....22
STOP vs. CHANGE.....22
COMMON SENSE IS ALWAYS A GOOD IDEA.....23
PUBLIC RELATIONS.....23

GST #2: ACCURATE ROAD TESTS.....24

GST #2A: MEASURING YOUR MPG THE HARD (BUT ACCURATE) WAY.....24
GST #2B: MEASURE GAS ECONOMY BY COMPUTER!.....26
SCANGAUGE ALTERNATIVE: AUTERRA DYNO-SCAN.....28
EXPECTED RESULTS.....28

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FUEL ECONOMY PAPER LOG.....31

ONLINE CALCULATOR.....31
FUEL ECONOMY LOG.....32

GST #3: SCANNERS.....33

WHY YOU NEED A SCANNERS.....33
HOW DOES IT WORK.....33
SCANNER A: ScanGuage-II.....34
SCANNER B: Auterra Dyno-Scan.....35

GST #4: TUNING YOUR ELECTROLYZER.....36

GST #5: 50-CENT OXYGEN SENSOR ENHANCER.....37

ENHANCE WHAT?.....37
THE CHEAP METHOD.....38

GST #6: $60 OXYGEN SENSOR ENHANCER.....41

THE ELECTRONIC ALTERNATIVE - EFIE.....41
EFIE ALTERNATIVE - DO IT YOURSELF 41
DIGITAL FUEL SAVER.....44

GST #7: ACETONE IN THE VAPORIZER.....45

GST #8: FUEL ADDITIVE FORMULA.....46

GENERAL.....46
SAFETY FIRST.....46
COMMON QUESTION MARKS DEBUNKED.....46
ACETONE + BORIC ACID.....47
XYLENE (XYLOL) IN THE FUEL TANK.....48
TORCO TP-7.....49
WINNING COMBO: AXG7.....50
HOW TO MIX ADDITIVES AND HOW TO POUR INTO THE GAS TANK.....54
ZERO-POINT ENERGY FUEL ADDITIVE???.....55

GST #9: NEW FILTERS.....56

GST #10: HIGHER OCTANE VS. ETHANOL, AND OTHER GAS TIPS.....57

HIGH OCTANE GOOD, ETHANOL BAD.....57
NOT ALL GAS STATIONS ARE CREATED EQUAL.....57
THE "SCIENTIFIC" APPROACH.....58
GAS PUMP TIPS & TRICKS.....59

GST #11: DUAL-EDGE MAP SENSOR ENHANCER (DEMSE).....60

ALTERNATIVE ENHANCER.....60
A STUPID LITTLE RESISTOR???.....60
BACKGROUND OF THE INVENTION - WHY IS THIS NEEDED.....61
HOW DOES THE MAP SENSOR WORK?.....62
HOW DOES THE MAF SENSOR WORK?.....62
THE ENHANCER.....63
INSTALLATION AND TUNING.....64
HOW TO MAXIMIZE YOUR BENEFITS.....65
MY CONCLUSIONS.....66
MARKINGS.....66

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TROUBLESHOOTING.....67
FANCY DESIGN.....68

GST #12: MAF SENSOR ENHANCERS.....69

INTRODUCTION.....69
THE ENHANCER.....70
MECHANICAL MAF SENSOR ENHANCER.....72

GST #13: FUEL HEATER.....75

INTRODUCTION 75
ENVIRONMENTAL RESPONSIBILITY.....76
SAFETY FIRST!.....76
ROAD TESTS.....77
INSTALLATION.....77

GST #14: PCV ENHANCER.....84

BACKGROUND OF THE INVENTION.....84
WHY IS THIS NEEDED?.....84
STRUCTURE.....86
HISTORIC "PCV JAR" DOCUMENT FROM KEELYNET.....87
NO PATENT INFRINGEMENT.....89

GST #15: SPARK PLUGS & KIKER PERFORMANCE PRODUCTS 93

KIKER WIRES.....93
KIKER WIRES VS. KIKER BATTERY BOOSTER.....94
SPARK PLUGS.....96

GST #16: MOTOR OIL DOES MATTER.....98

WHY DOES IT MATTER?.....98
SYNTHETICS VS. "REGULAR" MOTOR OIL.....98
WHICH PRODUCT SHOULD I USE?.....99
RECOMMENDED OIL FILTER?.....99

GST #16A: BY-PASS FILTER.....101

WHAT DOES IT DO AND WHY DO I NEED ONE.....101
TOILET PAPER FILTER!.....102
CONVENTIONAL BY-PASS FILTER.....103

GST #17: TIRES.....104

TIRE SIZE MATTERS.....104
TIRE PRESSURE.....104

GST #18: DRIVING HABITS.....106

WHAT ARE "DRIVING HABITS"?.....106
INSTALL AND USE A MPG GAUGE.....106
WHAT'S MY OPTIMAL SPEED?.....106
BRAKING.....110
SOMEWHAT RADICAL IDEA.....110
AUTOMATIC IDLE SHUT-OFF.....112
FURTHER READING.....112

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GST #19: COMPUTER REPLACEMENT & RE-PROGRAMMING.....113

HACKING THE COMPUTER.....113
NEW COMPUTER VS. ECU CHIPS.....113
PROGRAMMERS – DEVICES.....115
EDUCATIONAL PROJECT.....116

GST #20: CHANGE THE CAR?.....117

OPTION1: TO REPLACE OR NOT TO REPLACE?.....117
OPTION2: INSTALL SPOILERS.....117
OPTION 3: AERODYNAMICS.....119

GST #21: DEMAND YOUR TAX $$$!.....120

WHY IS THIS HERE?.....120
NOTES ON "QUALIFIED VEHICLES".....120
WHO REALLY DESERVES THE REFUND?.....121

GST #22: GET HELP.....122

FUTURE - VISION.....122
PRESENT TIME – SURVIVAL AND MUTUAL HELP.....122
HOW TO CONTACT US.....122

WHAT'S NEXT?.....123

WE NEED YOUR HELP.....124

THANK YOU FOR READING THIS BOOK!.....124
HOW TO MAKE MONEY WITH THIS TECHNOLOGY WITHOUT EFFORT.....124

GLOSSARY.....125

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ACKNOWLEDGMENT

THIS BOOK IS DEDICATED TO ALL YOU "MILEAGE SEEKERS" OUT THERE!

THANK YOU FOR ALL YOUR FINANCIAL AND *MORAL SUPPORT* - YOU GIVE MEANING TO ALL OUR YEARS OF RESEARCH AND EXPERIMENTATION

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LEGAL DISCLAIMER

THIS BOOK IS PROVIDED FOR INFORMATION PURPOSES ONLY

Using some of the devices or methods described in this book on a running vehicle may be illegal in your country. Check with your local Emissions Control Department, or whatever they call themselves. My lawyer says this is nonsense, however I've been told unofficially (i.e., by rumors) that some methods are illegal to use on public roads in the USA. Since I could not reconcile who's right (maybe both?), I'm giving it to you for off-road testing, as well as for experimentation outside the jurisdiction of the USA.

IF it is illegal in your country, then don't ask a licensed mechanic because he will justly refuse installation in your vehicle since he may end up losing his license. **Doing it yourself may be borderline legal if you install it IN YOUR OWN PERSONAL VEHICLE.** THIS IS NOT A LEGAL ADVICE because I am not a lawyer and I definitely do not know the laws of your country!

INFLICT CHANGE

However, somebody must do something to make this technology approved, embraced and furthermore ENDORSED by all governments of the world; so if you know a government official, senator or parliament member who may be willing to support green technologies, present the issue to them and ask for their help.

For example, today you may fail a smog check only because the harmful emissions coming off your tail pipe are **TOO LOW**! Their assumption is that there must be a hole in the exhaust pipe... This attitude is a punishment to all operators of green vehicles – and must be labeled ILLEGAL by your government.

Some people will tell you that petitions don't work, that politicians are all crooked and care for nothing, and other there-is-no-hope-anywhere songs. Those are lies. The truth is that, although change is hard, it **can** happen and will happen. And in order for it to happen, we must all do our part. Whatever you can do – just do it!

The wrong thing to do is nothing. **Whatever you can do is BETTER THAN NOTHING.** Much better than nothing. Your "small" action may tip the scale and create an avalanche. Let's change the rules in our favor. We deserve it, don't you think?

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WHO CAN YOU BENEFIT MOST FROM THIS BOOK

THIS BOOK IS NOT FOR "NORMAL" DRIVERS

In this book I am not going to talk about any other vehicles, only those that carry HOD, or **Hydrogen On Demand** systems. HOD refers to any one of several technologies out there to produce hydrogen on board of a vehicle WITHOUT storing any of it. All that is produced, by electrolysis of water, is consumed almost immediately by the engine.

So please, don't even ask me if a fuel heater works on a non-hod diesel train from 1923 because I don't know and I'm not interested. I am a HOD experimenter and that's all I can tell you about, is my experience. Either my direct experience in my own cars or the experience of my experimenters around the world. We live in HOD world.

Here's how our new HOD system looks like:

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WHAT is GST?

GST stands for Gas Saving Techniques. It refers to a whole group of technologies and methods which I find valid and seriously workable **to save gasoline and reduce emissions**.

So we will use the plural and singular versions of this term. Each GST will work for you separately – but together all "GSTs" will add up to a whole lot. GSTs, as a combined technology, is a perfect sister to **Water4Gas** Technology. You will agree with me after you've read this book. Or not.

Let's number these babies – GST #1, GST #2, and so forth - so each "GST" will refer from now on to one single and distinct technique of squeezing more benefits out of each Dollar or Yen or Ruble. And let's see how much YOU can squeeze by using them.

You don't have to. I just want you to KNOW about it and know the various GSTs. If you use a certain technique or not, that's your choice.

NOTE: GST NUMBERS ARE ARBITRARY! That means that #3 is not necessarily more important or more powerful than #5. The number system are for easy identification and nothing else.

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HOW TO GET THE BEST POSSIBLE MPG

Now, as you read this book you may be asking "Hey Ozzie! This techniques is not new! Why include it here?"

Ok, got you. You're right. Several books and websites have been written on the subject of gas saving tips and driver's contribution such as driving habits, maintenance awareness and so forth. Yet none of these books or websites that I have seen are ever complete, and they do not relate **directly** to **Water4Gas** technology.

In this book you will learn to push the envelope of gas economy as a sidekick, or in other words a complimentary knowledge to **Water4Gas** technology.

So lets re-define this technology: GST is a series of techniques you should use if you're seriously interested in saving gasoline by mainly - but not only - using water as a gasoline supplement.

DESCRIPTION OF THE 305 MPG PHOTO

When I started seeing unbelievable mileage readings on my ScanGauge-II (MPG reader, between other things), I was so excited that my hands were shaking and kinda confused. I almost had a shot at the 340 MPG but the camera slipped. But you'll believe me that it happened. That is, if you believe that this photo is real. Only if you believe it is possible at all, under whatever circumstances, on a stock car. Well, almost stock. It has **Water4Gas**.

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Now the 305 MPG depicted here is not an illusion, but it is the utmost high-range readings with the system. Not an average! Averages of 50-80 MPG are impressive but not that great if you ask me. I want 100 MPG. Even 200 and beyond. I believe it is possible and we're working in that direction.

Meanwhile, at the time of writing, I want to impress upon you that if you push the envelope, the average is about to raise as well. That's what this book is all about. It's about how to push the envelope with a lot of many small streams that combine to a river.

Back to the photo. One of the tricks of fantastic MPG is coasting (driving in neutral) downhill. With the right ingredients under the hood and the other methods described here, it can have you running at 300 MPG or thereabout. Downhill, downhill, boy. But average that with yet impressive flat and uphill numbers, and you get a great average.

If you think there are camera tricks here, you should test it with your own vehicle and find out.

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HOW COME THIS IS NOT PART OF NORMAL CAR TECHNOLOGY?

I'm sure you have asked yourself some disturbing questions, such as:

- *If all this is so great, then why don't the major automakers incorporate these low-cost devices in their car designs?*
- *Don't they want to sell more? They'll be able to sell more cars if they'd make them more efficient!*
- *How come they don't teach these things at school?*
- *How come the media doesn't tell us about it?*

These are good questions! You ARE a thinking man. You are NOT stupid.

Unfortunately somebody else is stupid. That is to say, short sighted. What happens in actual fact is that the factories are not independent. They are directed and controlled by greater forces of economy and other vested interests. Short sighted, yet powerful (filthy rich, that is) businessmen, direct the general flow toward lower and lower gas economy. **They want you to waste gas.**

That's the reason for all these gas hogs on the road. Lately they dropped in sales because people are starting to realize what a trap they have been led into: temporarily affordable gas prices, and giant SUV's pushed on us as the fashionable thing to have; the automakers and the advertising machine that serves them have pushed everybody and his wife to purchase a great "Sport Utility" vehicle that never sees any more sport than hurrying up to a show-off party or shopping.

We've been conditioned to think "performance", and we started to think in terms of "GOOD VEHICLE equals FANCY equals BIG AND STRONG equals SHOW OFF equals HORSEPOWER" and so forth. Look at the endless stream of TV ads for huge vehicles and luxury sports cars. Nobody tries to sell mileage.

They want you to waste gas and they want engines to run hot and burn valves and pistons and what not, and they want the systems in your vehicle to clog itself up with unburned fuel. THEY THINK THEY WILL SELL MORE CARS THAT WAY AND IT SEEMS TO BE WORKING WELL. For a while, only for a while (short sighted, I said) because they are destroying the economy and the land for their own sons and daughters.

Automakers know they have poorly designed vehicles – and the fact that every car MUST have, by law, a large and expensive catalytic converter - is an admission that they don't burn gasoline correctly in those new designs. (The function of the catalytic converter is to burn AND WASTE all the unburned fuel caused by poor engine design!!!)

George Wiseman from Eagle Research, Canada, says "fuel injection systems are actually designed to prevent efficient combustion!"

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Cars developed in Japan are more mileage- and environment-friendly, but are not fantastically better. There is actually not ONE really good car in all those glittering show rooms around town. Electric hybrids, you said? I hear you. Those are fantastic and quiet in the parking lot, gliding near you with barely a whisper. But on the highway they are in the same stinking ballpark as everybody else.

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According to a recent study by WantToKnow.info, a worldwide research group, since 1908 and the Ford-T, the **average mileage DROPPED by almost 40%!**

While every other technology soared through the roof during these past 100 years - MPG has become twice as bad. Do you see a pattern yet?

And when you see that all this is happening in spite of severe warnings against planetary destruction and oil dependability being a national hazard, you can clearly see that we're dealing with criminals. In positions of power, but criminals just yet. To rely upon them to correct the situation is a big waste of time. Why? Because once they have done a crime, they MUST continue to do it in order to justify their actions. They have no plans to correct their car designs any time soon.

Have you watched the movie "who killed the electric car?" It is not a new scene. For many years, from time to time a too-good of a design slips by their wachful eye into the market. Soon after, that model is recalled and disappears (it's not ancient history – Toyota's 100-MPG **Eco Spirit** has been "erased" only a couple years ago). They know what they are doing.

YET SO DO WE. We know what we are doing – we are **filling up the gap LEFT BY AUTOMAKERS,** detecting and testing any doable and affordable gas economy trick under the sun; but not only that - we also teach it to others. This a grassroots movement that will win by numbers. Quiet numbers of DOERS, not TALKERS.

We ask you to lead the way and show the way to your friends, your family and the people of your country. Your family's future relies on what you do here and now.

THANK YOU!

WATCH THIS 8-VIDEO SERIES BEFORE THEY DISAPPEAR

1. http://www.youtube.com/watch?v=NbakN7SLdbk
2. http://www.youtube.com/watch?v=UGGjbDjnNzw
3. http://www.youtube.com/watch?v=q39ic04vhNo
4. http://www.youtube.com/watch?v=ZKCyCYz_aHY
5. http://www.youtube.com/watch?v=7TYmSGwAumk
6. http://www.youtube.com/watch?v=fbwMOvV6ctg
7. http://www.youtube.com/watch?v=L5HGHsy3H_0
8. http://www.youtube.com/watch?v=CC61X78-OI0

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INDIVIDUAL EFFECTS ESTIMATED

GENERAL

How much does each GST really contribute to the whole?

The question is simple. The answer...well...not so simple. It's hard to say exactly how much, in percent or number of miles, each component will yield for each car and environmental conditions. Especially it's hard to predict what each COMBINATION of GSTs will yield.

But it is clear at this time that a COMBINATION of many factors will be beneficial, because they have been proven to support each other and contribute to the workability of each other, what is nowadays called "synergy".

In a "synergetic" combo, two or more ingredients work together to produce an effect that is greater than the sum of the parts. In other words they MULTIPLY each other rather than add up.

So again, the contribution of each GST can only be estimated, but I will try to estimate each one so you get an idea. Estimations are based on my experience and the experience of other waterfuel experimenters. I will also try to estimate if a certain GST is INDEPENDENT, or does it need to work in conjunction with another part of the whole. I will try to explain why. But you must understand that the number of factors is so great that **nobody** can tell for sure. Even one driver, one car, one gasoline grade and a specific system – will function different today than next week if the weather has changed.

For example I found out one day while measuring a lot of MPG numbers on various road conditions, that the greatest mileage gain I got was for a steep uphill condition at a fairly high speed. The difference was an eye-popping 77%. It took me some time to realize what I was looking at. Finally I learned that road conditions mean a lot, way more than I had realized before.

You already know that LOAD will change your mileage. But my road test taught me that LOAD also implies how much PERCENTAGE you can gain (how much better it can get, in other words). My "guesstimation" at this point is that in most high-load conditions including big bulky SUVs, riding uphill with full passenger capacity, high frontal wind and pushing through water, etc., you will gain a lot of gasoline savings by using some or all GSTs.

Remember that we're not trying to cover the exact details yet, which will be detailed later in this book, but we're now only interested in the significances and inter-actions of the ingredients.

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OPTIMAL SYNERGISTIC EFFECTS

The best synergistic (see def.) effect, or in other words optimum fuel economy, will occur when you have the Electrolyzer working together with AXG7 (fuel additive – formula given later), the Fuel Heater and an electronic enhancer such as DEMSE (GST #11) or EFIE. This does NOT undermine the values of such important GSTs such as good driving habits, but those can work independently of any other combination.

Another good combination I can recommend, and this is probably the most minimalistic combo, is the Electrolyzer with an electronic enhancer. Depending on the car's model year (older models especially carburetors or diesels), the Electrolyzer together with AXG7.

KEEP YOUR EXPECTATION WITHIN REASON

You want your car to run on 100% water? How about 150%? Well this is impossible. The reason I'm mentioning it is that some well-intentioned guys would love to maximize everything beyond reason. What they would do here is take the MAXIMUM possible contribution of each ingredient in the system, add them all up and come up with more than 100%... Well you understand that this not possible. Take everything said here with realistic estimation.

If this "soup" of ingredients, after not too many trial-an-error experiments, brings you beyond the 50% mark, you're in the green. You should be very happy. Not that you must stop there. I didn't. All I'm saying is let's all be realistic.

Personally I believe that approximately 97% water to 3% gasoline is possible, but with a 59% mileage improvement I'm **far** from it. Maybe half way there at best. And at the same time I'm happy because I can pocket hundreds of fuel dollars every year.

GOOD MECHANICAL SHAPE

ABSOLUTELY VITAL

Later in this book I will explain about the importance of having a vehicle in good mechanical and electrical order. This is a MUST, basically a condition without which you cannot expect much benefits from your Water4Gas system. How much in %? Don't know, but it's the one that will let all the other numbers be, or kill them all. So let's just say it's the make or brake of all other individual contributions.

YOU THE DRIVER

10% to 50% MPG gain

I deliberately avoided saying "driving habits". By "you the driver" I mean more than just driving habits. It's how you treat your car, how you treat your own body. Driving

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under the influence of extreme hunger or exhaustion is almost as bad as driving under the influence of drugs and alcohol.

You are also responsible to keep the car in good shape, to check water in the Electrolyzer, etc. This GST, with your dedication and especially as assisted with the use of a ScanGuage or Auterra Dyno-Scan, can probably do better than add 50% to your mileage.

ELECTROLYZER

-1% to 37% MPG gain

The introduction of HHO into older cars and many diesels, gained up to 37% right off the box in our experience. But in some cars, especially 1996 and newer, when used by itself it will either not gain more than 3%, or even gain a NEGATIVE mileage due to the computer problem that we will discuss later in great detail. I can say almost certainly that newer cars must employ either a MAP sensor, Oxygen sensor or MAF sensor enhancer.

There's an interesting observation about mileage gains in these newer cars, is that in many cases you will see immediate MPG improvements, if you watch closely. But those will disappear after a couple days, maybe half a fuel tank or so. In some cases by the time the driver gets to actual testing its too late to see those gains that have come and gone, and he or she reports "no gain". In any case the solution is these cases would be to use any of the electronic enhancers described later in detail.

Remember, the Electrolyzer is not a GST by itself. It's the heart of the system. It's the very thing we're trying to assist and enhance with these other things.

CARB AND TIMING

10% to 15% MPG gain

Tuning the carburetor and advancing the timing can make a whole lot of difference in those older cars that still have manual tuning. It's actually easier than making changes to computerized systems since those later ones are quite rigid.

FUEL HEATER

0% to 15% MPG gain

In my car the Water4Gas Fuel Heater did moderately, about 3%. But depending on the car and also depending a lot on the WEATHER it can improve fuel economy by much more. It is also dependent on gasoline quality. It would be interesting to check the interaction between a specific octane from a specific gas station, together with the Fuel Warmer, in winter and in the summer. If the vehicle already has an electrical or mechanical fuel heater or a combination of fuel vaporizer/heater, another heater will probably add nothing. It may actually create overheating of the fuel in some cases. So I estimated 15% gain for vehicles with no original heaters.

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PCV ENHANCER

5% to 25% MPG gain

At the time of writing I still rely on other people's experience with this device. Keelynet reported back in 1992, regarding the original home-made device called "PCV Jar": "The most mileage increase heard, has been 40%. Twenty five percent is much more common."

SYNTHETIC MOTOR OIL

2% to 5% MPG gain

Synthetic oils will do wonders to your maintenance costs and engine response. But let's concentrate on mileage now. This will increase your mileage by a little something, but will do it independently of anything else you do. It simply add to any other GST. The older and more worn out engines need this kind of oil more, and will therefore benefit more gain.

XYLENE

3% to 10% MPG gain

Xylene can work its magic independently on any vehicle, with or without Water4Gas. I say "magic" but you don't have to believe me until you try it. What it did for me is it allowed me to lean down the mixture by approximately 6%, while maintaining engine temperature down and emissions very low. It works well with the Fuel Heater.

TIRE PRESSURE

3% to 15% MPG gain

I have seen report that it will do a lot, others insist it does nothing. From all I know you can safely increase tire pressure to a certain degree that keeps safety, doesn't wear the tires too fast and still gains a significant mileage gain. Mileage will improve more on older tires with little tread, because they have less drag.

BUT WAIT, THERE'S MORE!

There are other GSTs not mentioned in this chapter. But those that were mentioned are the major ones and I hope the above estimated numbers have given you a general idea what does what, and in what combination. Don't try to swallow it all in one day. Keep reading and refer to this chapter later if necessary.

When you experiment with these materials and devices for yourself, it will be much clearer and it will also build up your own certainty regarding what works **for you** and what doesn't.

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Remember, these numbers are rough estimations and they will be different for each driver and each car. That's why you may meet some mechanic or driver who will tell you that the numbers are totally different. He may be absolutely right – from his experience and point of view. Even geography is important. For instance here in Southern California I CANNOT test gasoline that does not have any ethanol, simply because there is none around. The state government has outlawed it or something.

BUT WAIT, THERE'S ALSO LESS...

There are products on the market and gas saving methods out there that are not mentioned here and did not make it into this book at all. Why? The reasons are that either:

(1) They are not effective alongside HOD, or
(2) They are not effective at all.
(3) Devices that are kept very mysterious and secret, so somebody can charge $500 for a few pieces of metal, or $200 for $5 worth of electronics, therefore preventing a wide base of experimenters.
And what's more, these secrets prevent the possibility of AFFORDABLE REPLICATION at your home or garage, for your friends, family members, or church members who can afford to pay you only a couple dollars or pay with some food or other help. It would be unfair to charge them an arm and a leg, you see, because they are already under duress of heavy taxation by the big dogs.
(4) Chemicals with secret/patented formulas that, together with a sharp marketing plan of some sort, force you to buy more and more of this secret formula product each and every month.

For example the use of ethanol is a disaster economically. Or product "turbo" this and "magic pill" that are not half as effective as they claim. I don't want to step on toes here because some of these people are my well-intentioned friends, but if my extensive research and evaluation did not find much of value in a certain product or method, or if you can get better results for less money from a similar product or method that YOU can do at home, then I just did not include it in this book.

You don't have to believe me. You can do your own research. Just let me give you two more examples real quick, that you can verify:

- Most "gas savers" on eBay are not worth the money, and some are an obvious risk to your engine. Poor results from "patented" products that you cannot replicate.

- On the other end of the scale, there's a guy on eBay offering two automotive energy inventions for $40,000,000.00 and $60,000,000.00, respectively. Let's wish him luck so he can walk away with a hundred mil, but so far I haven't seen any bids...

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ONLY THE BEST

So you see, I formulated and implemented certain firm guidelines to take us through this maze of gas saving methods. These guidelines included a specific filtering process, and this filtering process finally leaves us with only the best of the best. **Best for you**, not for some greedy businessman. Again, it's my own opinion according to my own extensive and exhaustive research into this field, and you're welcome to verify and feedback if you find any of my conclusions mistaken.

Now let's go into the details of the first GST, or more precisely a pre-GST, which is...

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GST #0: FIX IT FIRST!

GST #0A: FIX THE VEHICLE

It's number zero because it is the first thing you have to do before you even start talking about improving gas economy.

There's a maintenance philosophy that says: "If it ain't broken, don't fix it!", while another philosophy says that **preventive** maintenance is what you should do to to save in the long run.

I am not going to argue right now which of these philosophies is right and which is wrong. Maybe both are right, you know? Different people in different conditions, confronting a variety of budget problems and other considerations. For example I had an old truck that I wanted to get rid of. I couldn't wait till it falls apart, I just wanted it to die so I could get a new one. Why then, should I bother to fix it before the fact, or after the fact, or ever? I intentionally let it fall apart. The same happened to me a decade ago with an old motorcycle that I wanted to kill. That's just one type of consideration.

So I'm not telling you what to do with your maintenance decisions.

Do you say "If it ain't broken, don't fix it"??? Fine with me!

But hey, if IT IS broken – fix it. Before, after, whatever. Fix it.

Remember what I said at the beginning of the book? I am not concerned here about any other vehicles, only those that carry HOD systems. Now a HOD system can work in a broken car. It will cool down an overheating engine, for instance, and it will reduce emissions in a car that's screwed up so far down that it stinks to high heaven.

Yet it would be unfair and technically incorrect to demand miracles. And the main "miracle" you want your system to perform is GAS ECONOMY. I know because I'm just like you. Yet it has been found out that it really takes a miracle for gas economy to occur in a car that is out of tune, has a broken piston (for example) or is generally dilapidated.

So if you want to enjoy the full benefits and the awesome power and magic of HHO, start with a clean baseline. Have your car fixed, checked and tuned to factory specifications by a trustworthy mechanic. It is recommended to have a good tune-up done at least once or twice a year.

It would even be better to do a tune-up (and any fixing indicated by the mechanic) and then run a basic SMOG CHECK. Before installing the HOD. This establishes a "before" picture, or in technical words a "baseline". If then you see a great deal of change and you want to know what the numbers say, run **another** smog test, three weeks AFTER starting to drive with HOD. Compare the results and I think you will have something to drag about.

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Remember to ask your mechanic about any no-obvious factors that may be reducing your fuel economy. It's not just the engine! For instance a malfunctioning **BRAKE SYSTEM** might cause drag that the engine will need to fight constantly, damaging both your safety and fuel economy.

The **Alliance to Save Energy** of Washington DC (phone 202-857-0666) says that replacing a faulty oxygen sensor can improve mileage by up to 40%.

Another non-obvious factor is **WHEEL ALIGNMENT**. The problem may be the wheel rims, or only the tires. Misalignment will cause drag and vibrations. A professional wheel guy will be able to (1) align the wheels, and (2) balance each wheel and tire individually. It doesn't have to be the most expensive guy in town, especially if you do not intend to drive extremely fast. Yet doing the job will pay for itself in gas savings and a more pleasant ride.

Yet another common malfunction is a clogged or broken exhaust system. Especially have the exhaust repair shop check the catalytic converter, since those sometimes have parts collapse inside, blocking free passage of air. This is a job for the professional since in most cases you can't see the damage. I warmly recommend though to check all possible recommendations on the guys you deal with, otherwise they might try to replace perfectly workable exhaust pipes or converters, causing you unnecessary expense. And of course that's not the idea here, we're trying to save you money in the bottom line.

Make sure your gas tank cap is not damaged, loose or missing. 17% of gas caps are damaged or missing, causing a yearly loss of 147 million gallons of gasoline! Gas spillage might also be cause by overfilling (especially on cars with caps behind the license plate), so remember to stop refilling when you hear the first click of the gas pump.

GST #0B: FIX THE SYSTEM

Yesterday I was not happy with my mileage – it had dropped significantly. So I went over my Electrolyzer system (I currently use a 6-cell arrangement), put fresh water and cleaned it all up. It was due, after 4 months of no service. By the way that's the greatest part about multi-cell in my view, the low maintenance. Anyway the main passage of HHO was clogged, and the check valves needed cleaning. Took seconds to clean, but without that the system was actually not working at all.

It's back to life now. I'm not going to go over maintenance because that's detailed in the maintenance chapter of your User Manual, just wanted to remind you: be alert at all times to signals or clews that either your car or your gas-economy system might need service. It will pay off with big bucks, and I believe it will also make you proud.

* * * * *

Now we move on to the first actual gas saving method. Are you ready for some waste busters?

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GST #1: DON'T MOVE!

THE COMMAND OF STOP

GST #1 is don't move. You'll save a lot of energy by not moving...

Ok, ok, it's a joke. You don't want to stop moving. But seriously now, think about it, there are so many ways to stop waste, by simply stop moving.

Can you see how?

Let me explain, because there's a real technique here. Mainly a mental technique. The idea is to reprogram your thinking about moving. What if...let's just play with "what if" for a second..you with me? Let's just say what if you stopped thinking in terms of "reducing motion" and "reducing traffic"? What if you started thinking in terms of "stop motion"?

Why would you want to do that? I'll tell you why. Let's be practical. What does "reduce traffic" means? It means nothing by itself. Imagine you are managing a fleet of cars. Three vehicles, three hundred, it doesn't matter. But you have to make decisions regarding the traffic of that fleet. If you're reading this book I assume you wish to reduce its gasoline costs and other costs related to mileage put on these vehicles.

STOP vs. CHANGE

Now if you think "let's reduce the amount of motion", you put yourself in a muddle. You've just created a complicated mental and mathematical puzzle. What if you started thinking in terms of (1) STOP, and (2) START. You see, you'll take every motion in the overall traffic, every small particle of it and make a small and easy decision about it. You'll be asking yourself: is this particle, this little motion here, is this really necessary? If the answer is no, you may very well put a STOP order on it.

Got the idea?

You break down the traffic to small particles. Don't try to look at the complicated "matrix" like Neo in that famous movie. Always look at every particle and make a simple decision. Start vital particles moving. Stop non-vital ones. Re-direct them if need be. But again, re-direct is a little puzzle. Simplify it by dividing into its two sub-actions: first you stop the particle, then you start it in a new direction.

If this is not clear take a few small objects (batteries, paper clips, etc.) and move them around on the table. Practice on them as if they were cars or trucks in your fleet. Start them. Stop them. Practice the principles described above until you feel comfortable with **stopping** traffic.

By decisively "not moving" on some of the individual motions, by making that "stop" decision, you can save a lot of energy. Of course it requires correct planning

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otherwise you'll be choking the organization. Yet correct planning relies on you being able to change traffic in a manner that is comfortable for you. And practicing this GST will put you at ease so you'll be able to control a lot of motion sensibly.

COMMON SENSE IS ALWAYS A GOOD IDEA

There are age-old ways to save on motion, like pooling with other drivers, calculating your route in more clever ways, GPS, etc. I don't have to teach you all these, use common sense, get a book about it from the library. Yet thinking in terms of **Stop** and **Start** will improve your gasoline and maintenance economics before you even hit the road.

For more common-sense ideas read "Tips on Avoiding Unnecessary Driving" by the National Climate Change Committee: www.nccc.gov.sg/fueleconomy/avoiding.shtm

Other common-sense tips include driving without extra load, turning off the air conditioner when possible, etc. But let me tell you that light loads (100 lb) and air conditioners don't take that much more fuel. Especially windows, when open, don't contribute much to fuel consumption, especially at low to moderate speeds. Common sense, then, does not mean freaking out for every extra grain of sand. I want you to enjoy driving and not worry about the little things. It is my hope that this book will give you the proper balance on what really matters.

PUBLIC RELATIONS

Public relations, or PR, does not mean putting great conventions or sending a thousand press releases. PR means what **you** do so **you** will be well thought of. That's all. Now why am I bringing this up? That's because I know some of you guys out there are fleet managers. And if you're one of them you need to answer to a boss of some sort (your wife?...)

What if they ask you about the seemingly "weird" methods you started using?

Ok, now the first thing is don't worry about it. And then, simply explain the difference between these two things, Traffic, for one, versus Developed Traffic.

And Developed Traffic is what you don't want. It's the erratic motion of unplanned motions and it's moving things twice or more when they could have been moved only once. A lot of unnecessary motions and thus WASTE.

Explain the differences. Explain to your boss/wife that you're not trying to stop motion, only trying to stop DEVELOPED traffic.

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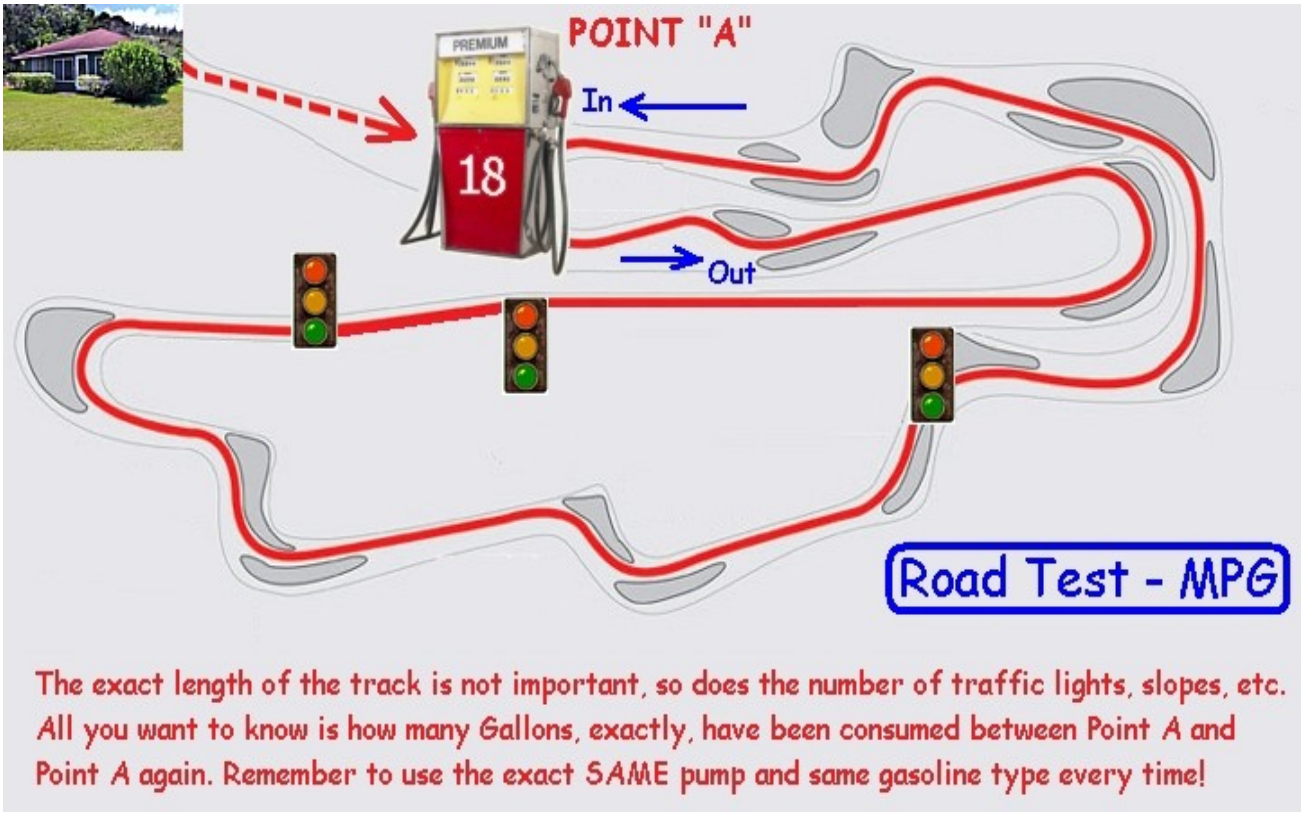
GST #2: ACCURATE ROAD TESTS

GST #2A: MEASURING YOUR MPG THE HARD (BUT ACCURATE) WAY

There are complicated ways to do this, and there are simple ways. Do you want to know about the complicated ones? Speak louder, I can't hear you... You don't? That's good.

So here's the simplest way to get accurate numbers. I found it useful when my mileage meter was broken and I needed a valid Miles Per Gallon measurement. Here's what I did. Refer to the drawing below.


POINT "A"
In
Out
PREMIUM
18
Road Test - MPG
The exact length of the track is not important, so does the number of traffic lights, slopes, etc.
All you want to know is how many Gallons, exactly, have been consumed between Point A and
Point A again. Remember to use the exact SAME pump and same gasoline type every time!

1. Choose a track of at least 30 miles, shaped as a closed loop. It could be the nearest highway or any other track as long as it has a nearby gas pump. At Point A there is a pump that **must be VERY close to the track or right on it**. There is no Point B.

2. The exact shape, number of curves, number of traffic lights, slopes or other obstacles on that track are not important. All you need to know is that it is possible to pass the track without ANY serious delays such as road works or

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traffic jams (I take the 101 North to Mulholland Drive late at night or Sunday morning).

3. Have everything ready for the test: car in good shape, **Water4Gas** installed and tested, gas money, paper and pen. At this point you want your **Water4Gas** device to be TOTALLY DISCONNECTED: pull the fuse out, disconnect the vacuum hose from the device and block it with a cap or small screwdriver (so that no extra air is vacuumed into the engine).

4. Start from home, drive to the gas station at point A.

5. If there is more than one pump in the gas station, choose ONE pump and stick to it throughout the test. The ground does not have to be level as long as you park at the same exact spot every time.

6. Insert the the nozzle in a way that you KNOW exactly how deep it goes. Usually, if you insert the nozzle all the way in and slowly pull back again, you will be able to feel a point where the nozzle gets stopped – let it rest right there. This is done so you can duplicate the depth of the nozzle every time.

7. Start filling out your gas tank and put the nozzle on AUTOMATIC stop. When the nozzle feels the tank is full, it will automatically stop – let it rest for a few seconds, then remove (to prevent gas spills). DO NOT ADD MORE FUEL, just release the nozzle and pull it out.

8. Register the time of day and start going out of the station in a certain direction into the track.

9. Accelerate quickly to a speed you're comfortable with, and keep driving as close as possible to that speed. Do not accelerate or brake unnecessarily.

10. Arrive back at Point A, drive back to the same pump and turn off the engine. Mark the arrival time (not important). Mark the trip length if you have a trip meter (not very important either but you may be interested in it later).

11. Open the hood and re-connect your **Water4Gas** system. Make sure all vacuum connections are ok and the fuse is back in.

12. Start the engine very shortly and check that HHO is being produced. Turn the engine off.

13. Fill out the gas tank exactly as you've done the first time. Use the same pump and gasoline grade.

14. Now carefully register the exact amount of gasoline that was filled in. This is the important number, mark it in your paperwork. Let's call this number **X** (for example 1.597 Gallons).

15. Go out on the road again and try to keep the same speed(s) for each part of the track. If for instance a certain slope slowed you down to 50 MPH the

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previous time, keep the same speed for that portion, even if your engine now feels much stronger and can do 55 MPH.

16. Arrive back at Point A and refill the gas tank as above. Register the amount of gasoline and mark it in your paperwork. Let's call this number **Y** (for example 1.217 Gallons).

17. Now all you have to do is do the following math: divide X by Y, than subtract 1 and multiply by 100 – that's your percent GAIN in MPG. In the example numbers give above, 1.597 Gallons divided by 1.217 Gallons is 1.3122. Deduct 1, then multiply by 100 and you get 31.22. This means you are gaining 31.22% better MPG with the new system.

$$\text{Fuel Economy (MPG)} = \frac{\text{New odometer reading - Old odometer reading}}{\text{Gallons of gasoline to refill tank}}$$

$$\text{MPG gain (in \%)} = \frac{\text{New MPG x 100}}{\text{Original MPG}} - 1$$

You should repeat this entire test with a different gas grade, different devices or different settings, etc. Which is an arduous job – which is why I warmly recommend the next GST. Tests of before/after a certain change should be near in time, and at the same hour/weather conditions. So if for instance you went on a road test one night, then the next day you install a new system/device/additive, test again at a similar hour the next night.

GST #2B: MEASURE GAS ECONOMY BY COMPUTER!

In the US you can get a compact but very smart digital gage, or more correctly a bunch of many gages in one little box. It's called **Scan Gauge II** and is defined as

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"Ultra Compact 3-in-one Automotive Computer". Its main usage for us is the constant, accurate and more importantly IMMEDIATE readouts of MPG as reported by the car's computer system. Saves you long trips and complicated calculations.

Scan Gauge does this by automatically connecting itself to the car's OBD-II (On-Board Diagnostic System) every time you start the engine. This gadget installs in seconds (the OBD-II connector is easily accessible, usually right under the dashboard) and it works well for almost all cars 1996 and newer. For older cars it would be very costly to build and tune such a system, in which case you'd better stick to the primitive but accurate methods described in the previous section.

On their website www.ScanGauge.com it sells for $170. They ship only to US and Canada. If you're outside the US/Canada, try your local auto parts or visit http://pureenergysystems.com/store/ScanGauge/ ($175, different model, check website for compatibility to your country). These guys sell the US/Canada model for $160.

I liked the simple menus and found the display very easy to read under all lighting conditions. I got mine for only **$149** in Culver City at a small auto parts place called "Dirty Parts". If you're not too far get yourself to 12012 West Washington Blvd, Culver City (Los Angeles, CA) Phone 310-390-9086.

Fun Quiz (don't take it seriously!) - How do you get 305 MPG at 62 MPH?

(Answer: The clue is evident on the RPM meter. The engine is not in gear...)

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SCANGAUGE ALTERNATIVE: AUTERRA DYNO-SCAN

For a similar price you can turn your Palm (or laptop PC) to a sophisticated scan tool. It's called Auterra Dyno-Scan. The package includes cable, adapter and software and can be purchased for under $150 from http://www.auterraweb.com

The advantage of this package is that you can record a history of performance for later analysis. You can also measure horsepower and torque, gear ratios and vehicle acceleration/top speeds, draw the results in graphs against time, and other goodies only possible with the new wonder of hand held computers. Now that I'm writing about it, makes me want to buy the Auterra Dyno-Scan for my TREO 650 smartphone!

EXPECTED RESULTS

MPG gains are not the only results expected of proper use of **Water4Gas** systems. Far from it – there's a lot more to be gained. MPG is the benefit that attracts most people's attention, because it's the determines the immediate out-of-pocket expense of driving your car around.

Let's see what else you can gain, and how soon you should expect it.

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- First time use: when you have installed your **Water4Gas** system for the first time, after about 30 seconds of engine run you will observe a significant change in engine noise. The reason is that the engine stops knocking and pinging due to a more smooth and even combustion cycle.

  It will be interesting to notice that this phenomenon will repeat itself many times after, especially when you start the engine from cold.

- Another change you will notice immediately, with whether the HHO device or the vaporizer, is that acceleration will be not just stronger significantly, but also much smoother including smoother gear shifts. AND A LOT MORE POWER OVERALL. When I installed my first HHO, it felt like somebody has just thrown out my 2.9 Liter engine and installed a much bigger engine instead, maybe 3.5 Liter. You'll have to step much lighter on the gas pedal to get the same speed even uphill.

- In my experience, I was running a Bronco-II for a month with this quieter engine. After that period we've learned that REALLY LOW bubbling action, or even no bubbling at all, may contribute to greater mileage benefits. As soon as we tried it on the Bronco, and installed a second HHO supply to the air filter - the engine become twice as quiet!

- Another thing that happened on my very first day with **Water4Gas**, is that the engine became very smooth all of a sudden. It happened after about 5 or 6 miles of running down the highway. I thought it was temporary due to the weather or something. After that first day, instead of reverting to the usual rough ride, the vehicle just kept improving by the day! Simple explanation: the engine steam-cleans itself from the inside while you drive. Result: less and less carbon deposits and other contamination caused by unburned fuel.

- If passing the smog is of concern, such as in the case of a bad catalytic converter, an old car, or whatever reason other than a broken engine (which you will have to fix!) - every **Water4Gas** system, whether HHO or "only" the vaporizer, has this great benefit. It stops the stink! Even with modern car computers and totally new catalytic converters, cars pollute the environment and poison your body while you drive. With any **Water4Gas** installed, stink will diminish drastically starting day 1, go down and and stay down.

- This is a continuing process that will take several days to complete. Best results for smog and engine smoothness would be achieved in about (I'd risk saying without knowing your car and its conditions) in maybe two weeks. So if you intend to take it up for smog, leave the system running for 3 weeks and then take it for smog. If you can afford two smog checks, have it checked BEFORE installation – then again after 3 weeks. The results are something we'd love getting in writing. If you send us copies of before & after we'll (a) thank you a thousand times, and (b) create some special gift for you.

- In the long run, REDUCED ENGINE TEMPERATURE, smoother engine and transmission operation, clean pistons and valves, etc, will pay out big in the shape of reduced annual maintenance. At least engine and transmission

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related. And how about yours and your family's health as a result of less smog? That's a long term result to your benefit.

- Now let's go down to what interests you the mosts – immediate reduction in out-of-pocket expense on GAS. If you're like me, you'd like to have a car that runs for free – RIGHT NOW. Well my friend, we're getting there. But for now we're "only" talking about significant gas savings in the range of 20%-30% depending on car, driving conditions, etc.

  So how much MPG to expect? That's hard to say exactly. There are so many variants. But 80% of the cars and trucks we've installed **Water4Gas** in, have gained between 20% and 37% in mileage, and even in one case up to 50% more Miles Per Gallon – and he was measuring fuel consumption VERY meticulously on his big GMC. So while there can be no specific promises here, you should experiment with your new system to maximize the benefits.

  The factors that may contribute to better MPG in your vehicle are described in the next section.

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FUEL ECONOMY PAPER LOG

The next page has a table that you can print and use to track and calculate your gas economy. Here's how to use that page:

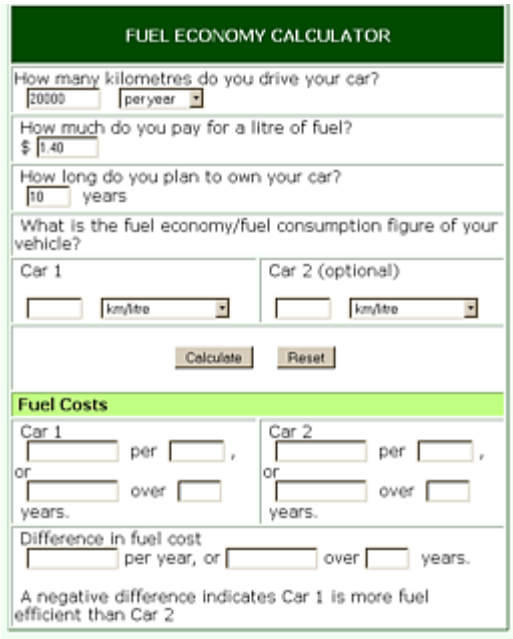
- Fill in the gas tank the first time without logging how much went in THIS time.
- Log your starting point: date and odometer, in column A and B respectively.
- At the end of the trip, log the odometer readout in column C.
- Calculate and write down the length of your trip In column D.
- Fill up the tank. In column E log in the gasoline that went in. THIS CALCULATION WILL WORK ONLY IF YOU FILL UP EVERY TIME.
- In column F calculate and write down your fuel economy for the trip, by dividing the number in D by the number in E.
- For each of these lines, log into column G any changes or additions you've made. For instance "with acetone" or "installed fuel heater", etc. Also any remarks that may be important later such as "ethanol fuel, car vibrates".
- It is recommended to establish a "baseline" to which future experimentation can relate to. This would simply consist of having a couple first lines for established gas economy BEFORE you make any changes.
- Once you have established a baseline, each line can refer to that baseline IN PERCENTAGE, by taking the number in F for that line and referring it to the F number of the baseline. If for instance today you have archived a gas economy (MPG) of 60, and your baseline has '40' in column F, then you have **improved** your gas economy by 50%. The formula is:

  (Current number in F)
  (---------- x 100) - 100 = % of improvement
  (F number in baseline)

ONLINE CALCULATOR

If you prefer to do some calculations online, use the government sponsored (National Climate Change Committee) calculator shown here >>>

Visit http://www.nccc.gov.sg/fueleconomy/Savefuel.shtm#calculator



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FUEL ECONOMY LOG

A	B	C	D=C-B	E	F=D/E	G: Changes made
Date	Odometer Start	Odometer End	Trip	Fuel Used	MPG	

GST #3: SCANNERS

WHY YOU NEED A SCANNERS

Scanners are a vital tool to know what's going on under your hood. These are little computer terminals that hook up to the OBD-II connector available in almost all cars 1996 and newer. It has valuable data about your computerized fuel system and other systems in the vehicle.

This data is meant to be used by mechanics only. But a few quick-thinking companies have learned to capitalize on the availability of this great bunch of data, and developed scanners FOR YOU – the driver and main user of the vehicle. From simple data such as ACCURATE speed (unlike the one on the dashboard that is always too high), through various readouts of engine and fuel tank conditions, down to the details of most diagnostic error codes.

In the middle of all those many readouts given by certain scanners – not all – is the pure gold readout of MPG! That's mainly and foremost what we want from a scanner.

HOW DOES IT WORK

Your vehicle's computer collects and stores data from its many sources – the sensors. It uses the data to compute the best engine behavior for your driving needs. Sometimes it does a lousy job at that, so let's just say that this is what it is SUPPOSED to be doing with the information.

But how is MPG read by the computer? The answer is simple: it is not! There is no MPG sensor. But a clever programmer can take the GPH (gallons per hour = fuel consumption) reported by the computer, divide it by computer-reported speed and by time, and voila! Here's the MPG number to display to the information-hungry driver.

Let's skip the exact math involved. The important thing is this - here is a tool to tell you exactly and IN REAL TIME the answer to a few major questions:

1) Is my system performing at its highest MPG capacity?
2) Has the last modification I just made (such as different gas station, fuel additive or new device) improved my fuel economy? Or maybe it's worse? (Just feeling or measuring power is not enough – power and fuel economy are not the same!)
3) How's my driving? Is it MPG-optimized?

Various scanners available. The ones described below are the most famous ones but not necessarily the only in existence. Anyhow there are barely a handful of scanners capable of direct MPG display.

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SCANNER A: ScanGuage-II

In the US you can get a compact but very smart digital gage, or more correctly a bunch of 12 gages in one little box, and much more. It's called **Scan Gauge II** and is defined as "Ultra Compact 3-in-one Automotive Computer".

On their website www.ScanGauge.com it sells for $170. They ship only to US and Canada. I've seen it offered for less PLUS FREE SHIPPING on eBay and other websites, so shop around.

If you're outside the US/Canada, try your local auto parts or visit http://pureenergysystems.com/store/ScanGauge/ ($175, different model, check website for compatibility to your country). These guys sell the US/Canada model for $160.

I liked the simple menus and found the display very easy to read under all lighting conditions. I got mine for only **$149** in Culver City at a small auto parts place called "Dirty Parts". If you're not too far get yourself to 12012 West Washington Blvd, Culver City (Los Angeles, CA) Phone 310-390-9086.

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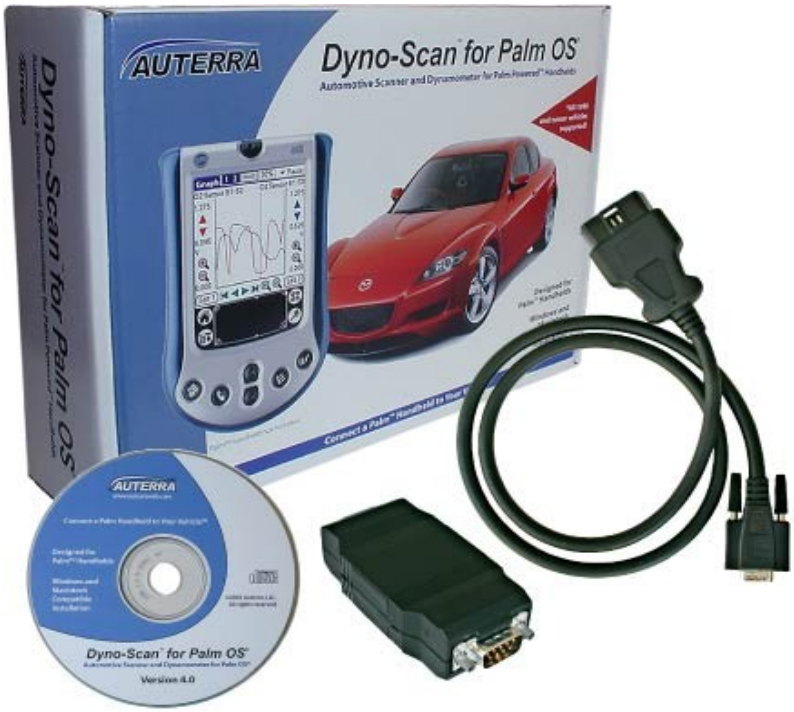
SCANNER B: Auterra Dyno-Scan

For a similar price you can turn your Palm (or laptop PC) to a sophisticated scan tool. It's called Auterra Dyno-Scan. The package includes cable, adapter and software and can be purchased for under $150 from http://www.auterraweb.com



The advantage of this package is that you can record a history of performance for later analysis. You can also measure horsepower and torque, gear ratios and vehicle acceleration/top speeds.

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GST #4: TUNING YOUR ELECTROLYZER

Tuning to what? To the best possible gas economy!

Once again, HOD means "Hydrogen On Demand". It refers to any one of several technologies out there to produce hydrogen on board of a vehicle WITHOUT storing any of it. All that is produced, by electrolysis of water, is consumed almost immediately by the engine.

Here are the basics of tuning your HOD system:

1. Play with the bubbling level. Too much bubbling = gasoline wasted. LOW bubbling level, very low in our experience, will get you the best results. But again, test it for yourself. You should notice change immediately after any change of adjustment. So you can do a series of road tests as described above, then compare the results and select the one which works best for your vehicle and environmental conditions. Yet there could also be cumulative effects that you will be able to feel and measure later on.

2. Dual vacuum lines as described in the installation chapters of your User Manual, may or may not improve your mileage. If you've already gone that distance and installed an input into the air filter housing or nearby, why not go an extra mile and try with or without the two extra check valves. Not enough is known at this time regarding the dual supply. In some cars it doesn't seem to matter much - we'd love to hear your own results regarding this.

   UPDATE 7-19-07: In some cars there is NO WAY the Electrolyzer will function properly if dual supply without the valves. So it is always desirable to install them. But the question is WHAT TYPE: they must be of the type that needs **low opening pressure and is designed specifically to high flow**. The best type is supplied by Qosina (contact info below) and is part number 91029 (fits ¼" tubing).

   Minimum order is $100 but **Qosina will send you free samples upon request.** Submit an online request or call 631-242-3000 (New York). Especially check out pages 72-73 of their free catalog (available upon request at www.Qosina.com).

3. Change of Electrolyte to water ratios will result in different levels of HHO production (more Electrolyte = more HHO). Some say that too much HHO for your engine size may lower MPG benefits, so try it out.

   I leaned recently that the problem is with the gasoline we're using. It burns slow, so the spark has to be delayed. In order to burn more HHO, we

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need to advance the ignition timing. But I don't have you'll be having that problem with a one-cell Electrolyzer. Just wanted to give you this piece of information.

GST #5: 50-CENT OXYGEN SENSOR ENHANCER

CAUTION: NEVER run an engine with a lean mixture unless you have some kind of a water system (Electrolyzer or Vaporizer, such as Water4Gas) installed and functional. The presence of HHO/water is vital to cool down the engine and to prevent pinging (knocking).

ENHANCE WHAT?

Here's the problem we're trying to solve here: we have HOD under the hood, right? We're adding oxygen into the mixture of gasoline and air, right? So far it's obvious. Now what happens is the the Oxygen Sensor in the exhaust pipe senses the extra oxygen Then the computer, according to its pre-programming, reacts by adding more gasoline into the fuel injectors. For what? Pure waste and definitely not good for the environment because the engine already has the energy it needs and more.

So we have to trick it to sense less oxygen.

The O2 Sensor method seems worked great on OBD-I. OBD means On Board Diagnostics, and it refers to the system of on-board vehicle computer and its sensors on fuel injected vehicles. OBD-I is the somewhat standard system on model years 1995 and earlier (again, fuel injected). On OBD-II (almost all vehicles 1996-2007) seems to need more severe intervention and that is solved with the enhancers described in other chapters. Too early to withdraw absolute conclusions, but this is what indicates at the time of writing.

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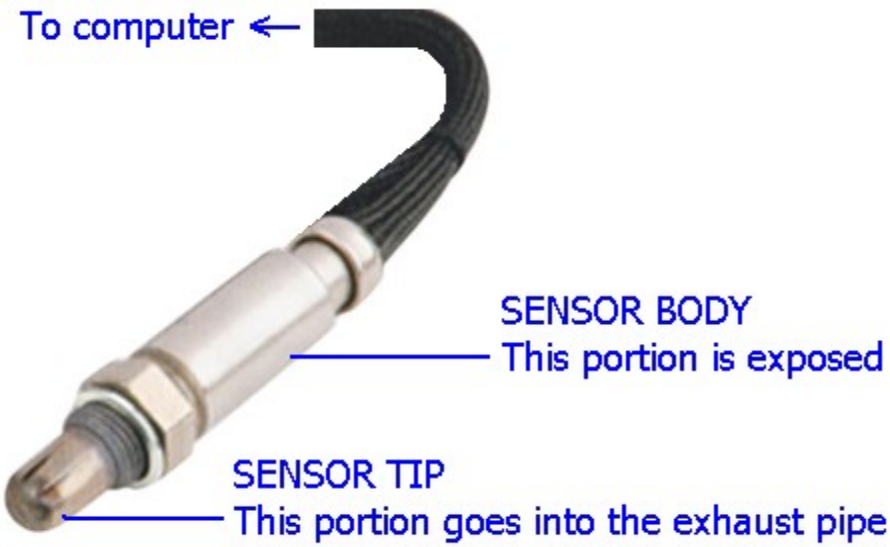
THE CHEAP METHOD

A low-cost and extremely simple method of dealing with the Oxygen Sensor is to somewhat block its ability to sense oxygen. To understand how this method works, let's get familiar with the main parts of the typical Oxygen Sensor:



The Oxygen Sensor is installed in the exhaust pipe near the engine and "senses" oxygen flowing through the exhaust pipe by comparing temperatures of its inner part (Sensor Tip) to the temperature of outside air.

This description is far from being accurate or complete, but we're not going to go into great scientific details. If you want to understand more about these sensors, visit http://www.aa1car.com/library/o2sensor.htm

The idea in this method is to seal the warmth inside the body portion of the Oxygen Sensor. We do this by insulating the sensor and creating a "mini-oven". The goal is to fool the fuel-injection computer (or Emission Control Module) into sensing too warm a sensor, thus signaling the computer: "The mixture is too rich!"

The computer then compensates with a leaner mixture and possibly a slight advance in timing. This results is smoother engine operation and much better MPG. This method is especially important in cold winter conditions and high altitudes, since then the Oxygen Sensor is too cold. I believe that EVERY car owner using Hydrogen-On- Demand should use this simple method.

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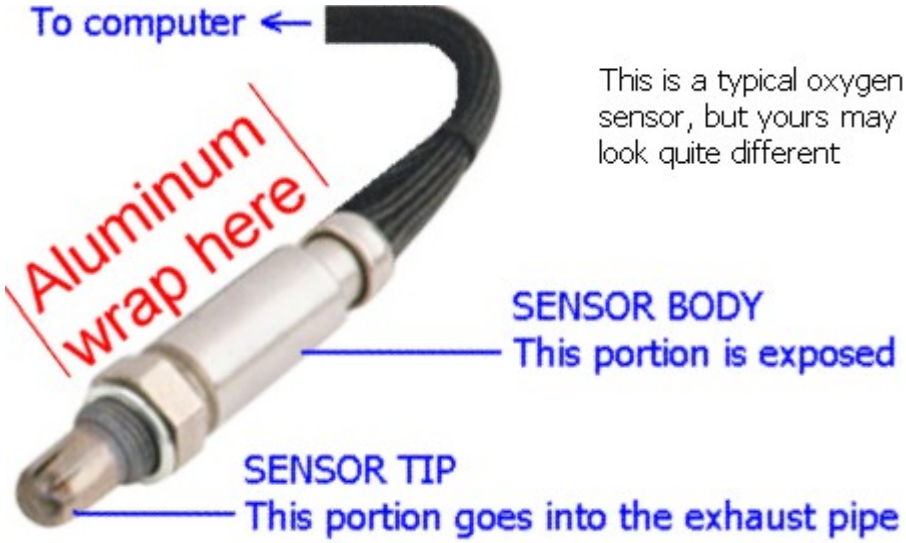
CAUTION: Never apply **ANY** tool in the procedure below – the sensor is kind of delicate. Not to the touch of hands, but tools might break or damage it.

1. Locate the sensor in the exhaust pipe near the engine. DO NOT REMOVE IT.

2. Wrap several layers of **Reynolds Aluminum Foil** --> (or similar) around the **body** of the Oxygen Sensor. The picture below illustrates the area to be wrapped.

3. Wrap several more layers of foil around the complete sensor (the exposed part) and cramp it tightly together BY HAND.


To computer
Aluminum wrap here
This is a typical oxygen sensor, but yours may look quite different
SENSOR BODY
This portion is exposed
SENSOR TIP
This portion goes into the exhaust pipe

4. Using .032" (20 gauge) copper wire, tie the aluminum foil in two or three places about 1" apart. This is done to keep it from blowing away. Tie it by hand force. DO NOT USE TAPE as it will melt and fall off in this hot (and sometimes wet) environment.

5. If you have more than one sensor (I've seen cars with up to 4 sensors), repeat the process for the other sensors. Someone told me to ignore the sensor on the exhaust manifold if it's too difficult to access, but if I were you I would take my time and do them all.

From recent road tests with a Ford Bronco-II, the simple method described above was the turning point, as far as gas savings. Running a single-cell **Water4Gas** device and dual-vacuum as shown in the Installation chapter, this little old truck achieved a phenomenal mileage gain of 56%. When I say "phenomenal" I refer to using such a low-tech home-made system such as Water4Gas. I'm sure the $12,000 "Kong" system or the $14,000 from "On Board Fueling" gets better results.

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But be advised that such a gain is good only for temperate driving. When I couldn't resist the temptation of the extra power and drove real fast (with fast accelerations too), the gain was significantly reduced. So drive safely and gently and you'll enjoy the full savings potential of this technology!

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GST #6: $60 OXYGEN SENSOR ENHANCER

CAUTION: NEVER run an engine with a lean mixture unless you have some kind of a water system (Electrolyzer or Vaporizer, such as Water4Gas) installed and functional. The presence of HHO/water is vital to cool down the engine and to prevent pinging (knocking).

THE ELECTRONIC ALTERNATIVE - EFIE

The second option to handle the oxygen sensor is to install an ELECTRONIC unit that does the same as explained above – fool the computer to believe that there is less oxygen, and therefore reduce the gasoline it injects.

NOTE: WITH WATER4GAS KIT YOU GET THE ELECTRONIC MAP SENSOR ENHANCER – SEE CHAPTER IN THIS BOOK. This alternative is for the oxygen sensor but if you have a MAP sensor in your car, according to my test cars the MAP SENSOR ENHANCER would work better and is cheaper to replicate.

To control the fuel mixture via the Oxygen sensor, order the instrument widely known as EFIE (Electronic Fuel Injection Enhancer) from www.Eagle-Research.com which costs $60 and has a long stocking period of 4 to 6 weeks. Indirectly I know the owner of Eagle Research, Mr. George Wiseman, I respect his integrity and professionalism and if you have the time to wait, I'm sure you're going to receive a quality product.

As I said I will not include in this book any secret method or product. One of nice aspects about George Wiseman is that he doesn't keep secrets. If you want to build an EFIE yourself, he will sell you the plans for about $9 I think. Water4Gas is not affiliated with Eagle Research in any way.

EFIE ALTERNATIVE - DO IT YOURSELF

Your second choice is to build one yourself from plans known as "D17" (number 17 in Patrick Kelly's free energy collection). Document D17 is available to **Water4Gas** readers (in the download area) and can also be found on the Internet. Its basic diagram is given below. It took me a long time to build one, it was hard getting the parts in my town, so I decided to give up mass production.

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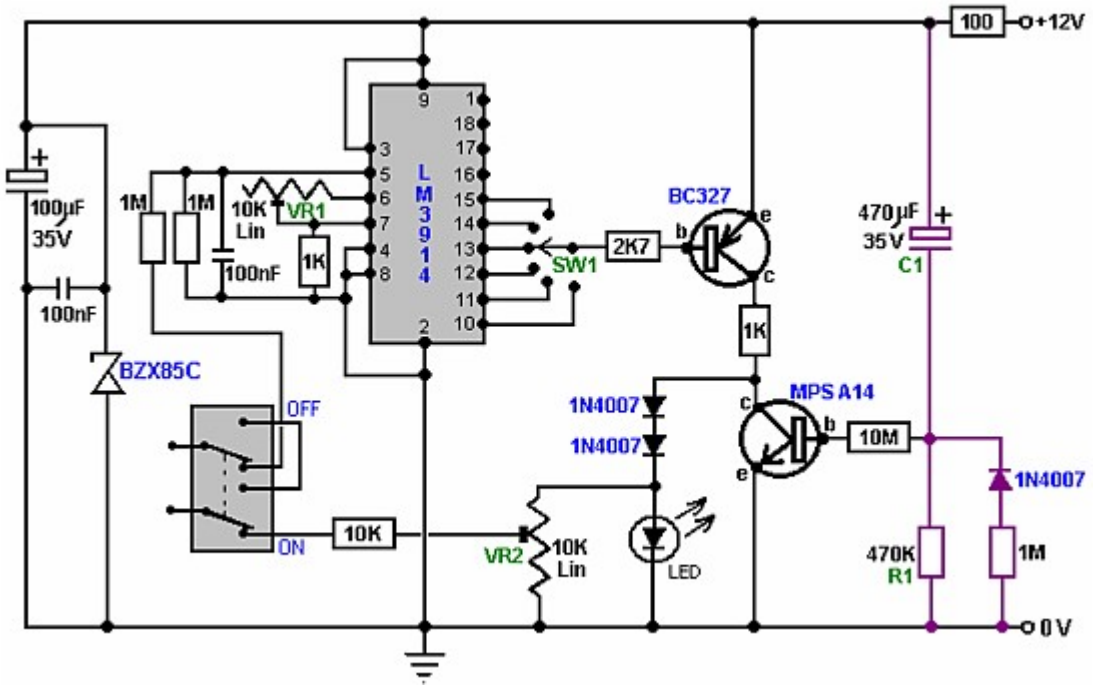
Yet it's a workable option because once you've put it together with good attention to details, it's not very complicated and can be debugged in a short time in case of mistake or malfunction.

As I said the hardest part was finding the parts. Online electronic stores such as Www.Mouser.com and www.DigiKey.com should be able to supply you with just about everything needed for this project.

The schematic diagram is shown below:



The switch will toggle between FULL RICH and ENHANCED MODE (in which you can dial down up your MPG using the knob). The pictures below are (1) an actual photo of the device I've built from these plans, and (2) the schematic structure I used (it's in the D17 plans).

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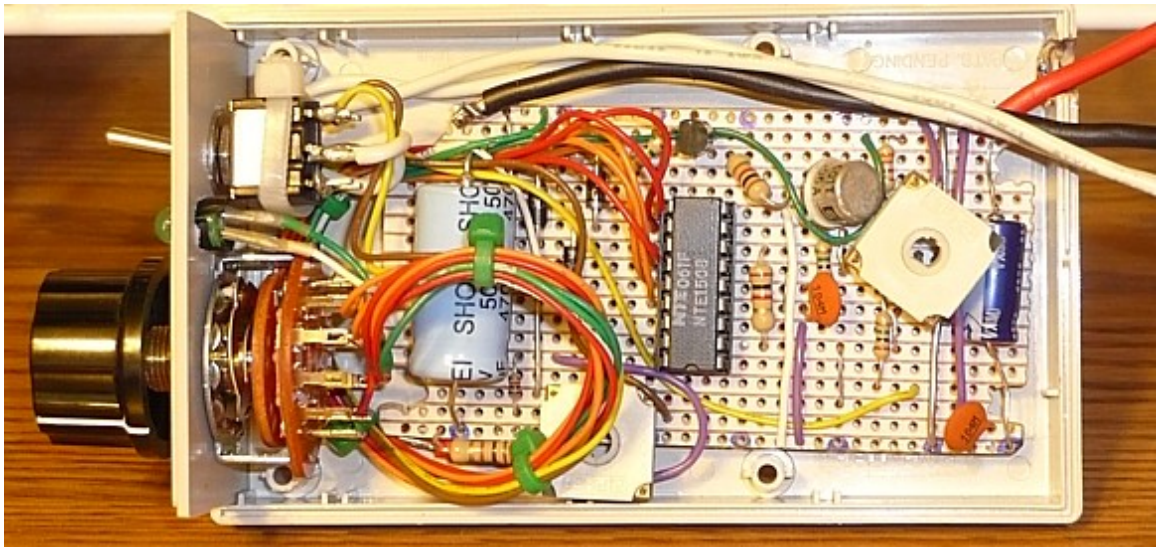

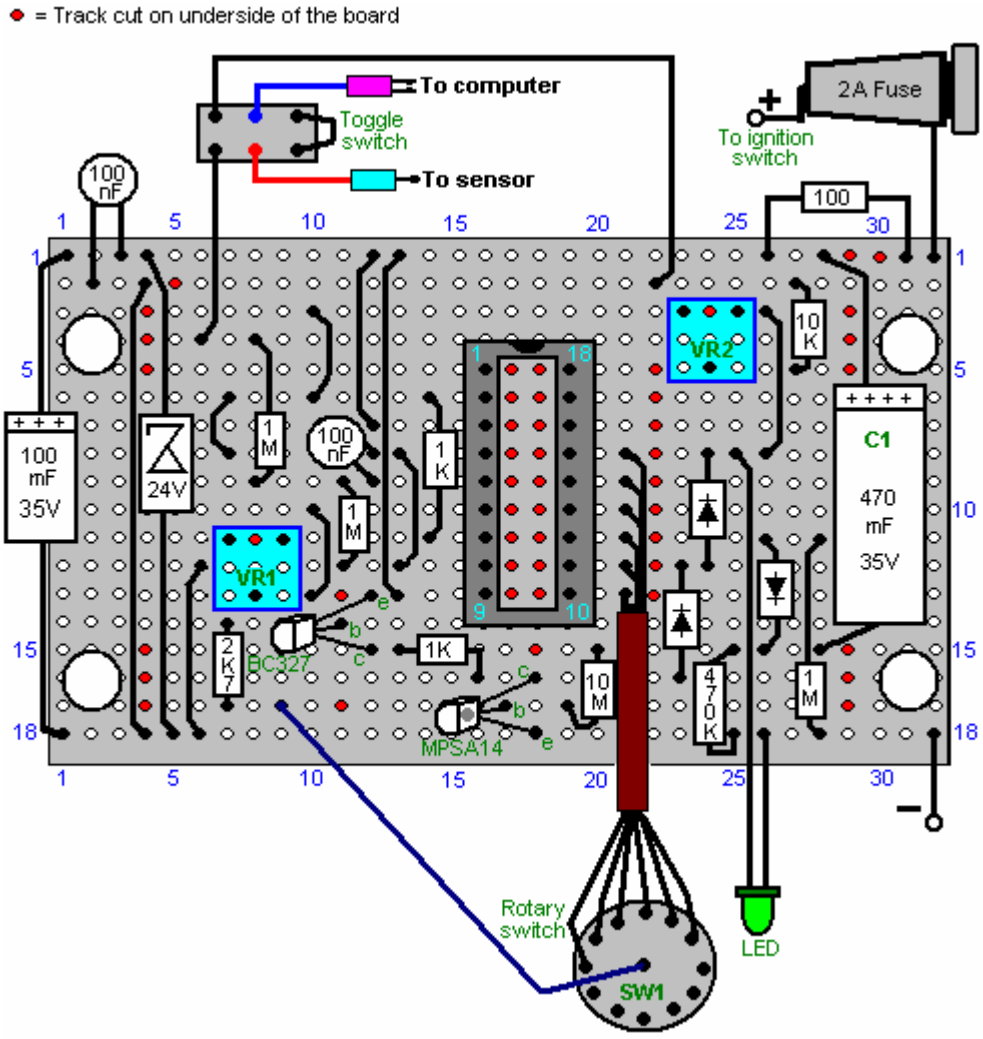

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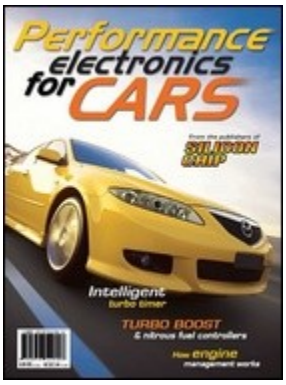
DIGITAL FUEL SAVER

Yet another EFIE alternative made by www.JayCar.com in Australia, available from www.autospeed.com and supplied as a do-it-yourself kit for $79.95



I have no personal experience with this kit. It is said to be capable of completely tuning the air/fuel ratio throughout the entire load range - at 128 load points. The KC5386 controller ($59.95 from JayCar.com) is required to program this device. It can be used on 0-1 Volt, 0-5 Volt and 0-12 Volt signals, making it is compatible with all MAP/MAF/O2 sensors (again, I could not verify this claim yet). Tested on Subaru Impreza WRX and STi, Nissan 200SX and Maxima, BMW 735i, Lexus LS400, and others.

To learn cheaply about this digital wonder without buying it, order the book shown here - only $19.80 from www.autospeed.com - it tells you not only EVERYTHING you need to know on building and tuning the Digital Fuel Saver, but also a wide range of other hacks for car electronics.

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GST #7: ACETONE IN THE VAPORIZER

**WARNING! THE FOLLOWING ADVICE IS SAFE FOR THE VAPORIZER ONLY!!! NEVER USE ACETONE IN THE ELECTROLYZER!!!

GST #8: FUEL ADDITIVE FORMULA

GENERAL

Fuel additives is such a deep and diverse subject, that it looks like a science all by itself. And it's changing all the time (though slowly) as companies like AMSoil and Torco keep coming up with new products that may be useful to us. Let's first check them one by one, and then look at WINNING COMBOS to boost Water4Gas technology, based on three ingredients: (1) Acetone, (2) Xylene and (3) Torco GP-7. You'll see in a minute how each ingredient works, and how they work together for you.

SAFETY FIRST

- **STORE THESE MATERIALS IN A COOL PLACE AWAY FROM SUNLIGHT, FLAMES, SPARKS, ETC.**
- **KEEP AWAY FROM CHILDREN.**
- **NEVER STORE THESE MATERIALS IN FOOD CONTAINERS!**
- **USE A LONG FUNNEL TO POUR INTO THE GAS TANK AND DON'T LET IT SPILL OVER THE PAINT OF YOUR CAR. It will cause discoloration.**
- **WORK IN A WELL VENTILATED AREA AND DO NOT BREATHE THE FUMES OF THIS MATERIAL.**

COMMON QUESTION MARKS DEBUNKED

- Is acetone harmful to my valves?
- Is acetone going to make my gasoline burn faster?

In an article by Lou LaPointe, hosted by Kiker Performance, LaPointe answer both questions by a certain "Absolutely not!" Visit this page to read more:
http://www.kikerperformance.com/Articles%20Questions%20on%20acetone.htm

ACETONE IN THE FUEL TANK

EFFECTS: Acetone boosts mileage and reduces hydrocarbon emissions by as much as 60%. It breaks down the fuel molecules to smaller particles – for better vaporization. Fuel cannot explode and a liquid, so the more it vaporises, the more it will do efficient work.

Acetone purity is more important than any other ingredient. Some of them so not carry honest labels so watch the following instructions carefully. Acetone from drug

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stores, as well as nail polish removers, may make you lose mileage, while causing other damages. Therefore I recommend that you use PURE ACETONE only, rather than the technical grade found in hardware stores.

OPTION ONE - in the USA the best source is Sally Beauty Supply, a chain store with branches all over the place.

Sally takes no web orders, but their website www.sallybeauty.com will give you the nearest location. International locations include **Canada, the United Kingdom, Germany, Ireland, Japan and Mexico.**

I purchased a 32 Oz bottle (item# 163190) for $4.69.

The gallon (128 oz jag, item # 163200) costs $16.99 which is a better deal.

SECOND OPTION - "Dupli-Color" is a a manufacturer of automotive paints, primers, and coatings. They have their own PURE acetone that's being sold in auto parts stores.

THIRD OPTION – none! Do not use "technical grade" acetone from a regular paint shop. It's only about 90% pure, but that's not the main problem. The problem is in that's been added to it: mostly additives such as Benzoate and water that PURPOSELY PREVENT PROPER VAPORIZATION – exactly what we don't want in an engine.

ACETONE + BORIC ACID

CAUTION: Wikipedia says: "While strictly speaking, Boric Acid is poisonous if taken internally or inhaled, it is generally not considered to be much more toxic than table salt". YET YOU HAVE TO BE AWARE THAT YOU'RE DEALING WITH A CHEMICAL – EXERCISE CAUTION WHEN HANDLING THIS SUBSTANCE: WEAR GLOVES & GOGGLES. KEEP OUT OF REACH OF CHILDREN. WORK IN A WELL VENTILATED AREA AND DO NOT BREATHE THE FUMES OF THESE CHEMICALS. STORE IN A SAFE PLACE. DO NOT STORE IN FOOD CONTAINERS.

This is a tip from Matt Parnell that I haven't tested yet.

"To mix [the boric acid], you should take 5gal of hopefully warm gas (let it sit in the sun a few minutes) and first add the acetone (do not forget that this is only half of 10, so if you put the other 5 gal into your vehicle, and do this for every 10gal). Then, take your boric acid and add it to the gas/acetone mix. This creates a suspension, where the boric acid particles are floating around in the gas. Keep adding until the gas won't

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suspend anymore acid, or just put in an amount that doesn't make you nervous (and just work your way up). The reasoning behind these substances is that the acetone makes gas burn hotter, and more efficient, and the boric acid lubricates things in the engine very well, adding efficiency. Some people even add boric acid to their oil, transmission, ball joints, power steering, and more! Best of all, both substances are relatively cheap."

WHERE TO GET BORIC ACID

In small quantities you can find it as "selfish killer" in the home garden stores. When used for pet treatment, they usually have acetic acid (vinegar) mixed in with the Boric Acid. If it comes in powder form, check the ingredients – use only pure Boric Acid.

The best source I located in the US for a low cost, near pure (97.7%) Boric Acid, is Mark Ovard of Guardian of Eden (http://www.dfwx.com/boric.htm). Phone orders by PayPal or by phone 325 365-3867.

XYLENE (XYLOL) IN THE FUEL TANK

EFFECTS: Xylene boosts mileage and reduces hydrocarbon emissions. It also enables the ingredients in the combo to blend well together. It also helps the Xylene and Torco GP-7 to fight the bad effect of Ethanol (which is coming to more and more gas stations around the country).

What is Xylene anyway? Not too many people seem to know about it. At the hardware store they will probably tell you that it's a paint thinner. But FireNet International (UK) says it is actually part of our everyday gasoline! Let me quote right out of FireNet's glossary – they define Xylene as **"Dimethylbenzene. An aromatic compound having the formula C6H4(CH3)2. Xylene is a major component of gasoline."**

When I added 3 oz of Xylene (without Acetone) to my gas tank, it gave an immediate improvement of performance as soon as I started driving. It added more power and it was much harder to kill the engine by leaning the mixture. This, together with the Fuel Warmer, has put me in the 60% fuel economy bracket. Well, according to my ScanGauge-II anyway.

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So Xylene all by itself can do wonders to raise MPG and reduce harmful emissions. It will even work better when mixed with Acetone and GP-7.

I got the Xylene off the shelf at Home Depot, the Painting Department where all the thinners are. It was $13.50 or thereabout for 1 Gallon in a metal can. I haven't seen a half or quarter gallon like other thinners. Ace Hardware in my city did not have Xylene at all.

The best source I have found for cheap xylene is Sherwin-Williams - use their store locator at http://www.sherwin.com/store_locator/store.jsp to find a store near you (in the US and Canada). The way to get the best price: the first time you buy xylene, open a merchant account (it's free) and get a gallon for only about $10, or 5 gallon "bucket" for only $9.20 a gallon. That's much better than the regular $13.50

Some of my tests:
7/10/07: adding acetone +xylene together with a Naphtha-based additive, all three together at once, resulted in noticeable loss of power and mileage. Xylene alone was more effective, but I'm still testing different combinations.

7/16/07: My power dropped because I used too much overall quantity! I should have kept it to the maximum OVERALL ratio of 3 oz per 10 Gallons. I used 2+2 oz which is too much. Next time I'll use only 1.5+1.5 of Xylene and Acetone.

TORCO TP-7

EFFECTS: GP-7 from Torco turns regular fuel into a mild lubricant thereby lubricating the rings near TDC (top-dead-center, the piston's highest point of travel) which is where the engine needs it most. In diesels it helps prevent the bad effects of extreme low sulfur in the fuel.

TORCO (www.torcostore.com) is a leading manufacturer of racing fuels and high performance products. They designed the GP-7 formula for high RPM air cooled and water cooled **2-stroke** racing engines. In case you don't already know, 2-stroke is different from the normal car (4 stroke) and requires lubricating oil to be mixed WITH THE FUEL.

The GP-7 has unique "oiliness" additives that reduce friction and wear. It also keeps ring grooves free of gummy residue and drastically REDUCES POLLUTION. It also raises Thermal Efficiency (how much of the heat stored in fuel actually translates to mechanical work, versus how much is wasted).

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Torco GP-7 can be found in motorcycle and snowmobile shops since those serve many 2-stroke models. You may call Torco at (562)906-2120 or order online – you can find several good sources selling the 16 oz bottles for $7.50

An alternative to GP-7 is **Torco SSO**, a 100% synthetic based 2-cycle oil designed for high performance snowmobile engines. "This super cold flow, smokeless formula offers unsurpassed protection against wear, friction, deposits, corrosion and plug fowling." Also found in motorcycle and snowmobile shops, or online sources such as http://www.OnOffRoad.com

From a research I just conducted in many motorcycle and auto parts stores around North Hollywood, I found out that Troco oils are hard to find locally. They have a specialized network of distributors, and the only easy way to find them is to conduct a map search at http://www.torcostore.com/about/get_torco.htm, or phone their corporate office at **1-800-67-TORCO** and ask for a Torco distributor near you.

7/31/2007: Seems like only motorcycle racing supply stores has this in stock. In Los Angeles I found a liter for $16.95 at **Cycle Trends**, 14901 Oxnard St., Van Nuys, CA 91411. The way to find your local dealer, if Torco doesn't know, is by searching Google, Yahoo, www.YellowPages.com or www.Local.com for 'motorcycle racing' together with your city's name, for example "motorcycle racing Los Angeles".

WINNING COMBO: AXG7

By "combo" Americans simply mean "popular combinations". AXG7 is an abbreviation of Acetone, Xylene, GP-7. Years of trial and error have found the best combo for fuel additive, that you can make at home without paying any scientist or inventor. The ingredients are readily available locally as described above, and each contributes its own little magic to the whole.

> Let me answer a common question here. Many users are afraid that these materials will blow up their engine, or damage some inner parts of their car, etc. So let me tell you right off that the FORMULA borough here is very safe. Yes, damage will happen if for example you use tons of acetone. It's your responsibility to make sure you measure the quantities right. If you're not sure – ask somebody!

I personally know Rod Sutphin of Florida, USA, an honest guy from an honest group - Kiker Performance. Sutphin published his own experiments with acetone and xylene, and his test (see results below) confirmed exactly what I have found on my own tests with a Ford and a Toyota.

- Test vehicle 1: 2003 Saturn Vue 4 cyl.
  Test vehicle 2: 2003 Saturn Vue 6 cyl.
  Test vehicle 3: 2004 Chevrolet Venture Van 6 cyl.

- All vehicles had 2 oz. of Acetone added per 10 Gallons of gasoline and 3-4oz. of Xylene added per 10 Gallons of gasoline.

- In all 3 vehicles the use of Acetone and Xylene added 3-4 miles per gallon!

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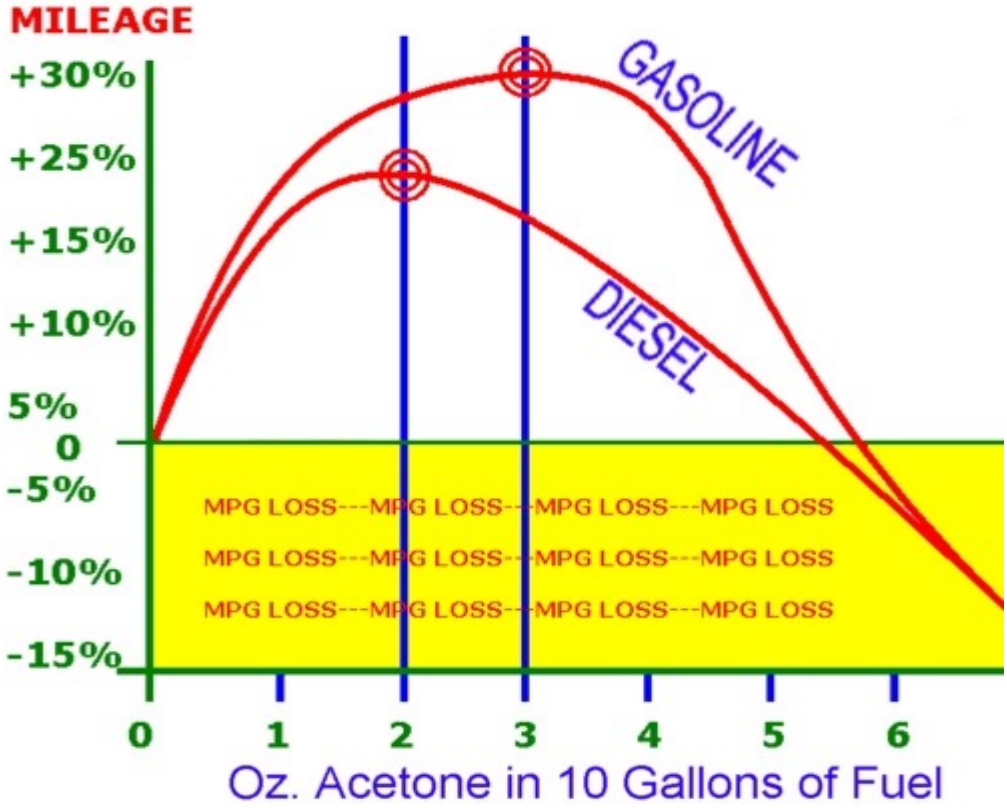
- In all 3 vehicles the engine ran much smoother and had better response.
- In all 3 vehicles you can barley smell the exhaust, acetone and xylene really help to cut down on emissions.

The graph below demonstrates two things:

1. There is a difference between the reaction of diesel and gasoline engines to acetone, and
2. There is a curve for each, whereby not "more is better", but there is an ideal balance point, and below or above that point you're not gaining as you could. The yellow area shows you that you may even be losing mileage.

THE GRAPH IS NOT UNIVERSAL, meaning it does not cover all the engines and gasoline qualities in the world, and is brought here to give you an idea but not exact numbers. It is a known fact to experimenters, for instance, that the various fuel grades available on the market will each react differently to acetone. More so with gasoline engines than diesel. Additionally, adding Xylene and other additives will change the graph as well.



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AXG7 formula (USA) has two parts:

PART 1 – balance of parts in AXG7	PART 2 – how much AXG7 in the tank
• 2 parts **Acetone** • 1 part **Xylene** • 1 part **Torco GP-7** (or **Torco SSO**)	Gasoline engines: **3 oz. per 10 Gallons** Diesels: **2 oz. Per 10 Gallons**

AXG7 - **METRIC** formula:

PART 1 – balance of parts in AXG7	PART 2 – how much AXG7 in the tank
• 2 parts **Acetone** • 1 part **Xylene** • 1 part **Torco GP-7** (or **Torco SSO**)	Gasoline engines: **22.5 gr. per 10 liters** Diesels: **15 gr. per 10 liters**

AXG7, in California prices, should cost $0.58 per ounce = $1.75 per 10 Gallon. Assuming it enhances the sum of $30 invested in 10 Gallons to 110% (10% MPG gain), we stretch a $31.75 investment to $33. Not dramatic but worth it because the GP-7 pays big in reduced maintenance.

However if you want to play with the formula, especially in order to make it more affordable, the first thing to reduce is the expensive GP-7 (go down hard, see table below), and then try to drive with equal amounts of xylene an acetone. In any case ACETONE is a major player and should be **at least** equal to the other ingredients.

AXG7-TS (TS for 'teaspoon' – see below the table):

PART 1 – balance of parts	PART 2 – how much in tank
• 30 parts **Acetone*** • 20 part **Xylene*** • 1 part **Torco GP-7***	Gasoline engines: **3 oz. per 10 Gallons** Diesels: **2 oz. per 10 Gallons**

* If you want to measure it in ounces, this translates exactly to to 5 oz. of Acetone, 3.33 oz. of Xylene and 1 **Tea**spoon (5cc) of GP-7.

Now this formula, AXG7-TS, in California prices, is only $0.11 per ounce = $0.32 per 10 Gallon. Assuming it enhances the sum of $30 invested in 10 Gallons to 110% (10% MPG gain), we stretch a $30.32 investment to $33. Much better economically, wouldn't you say? Provided, of course, that it indeed gives you the same 10% for your vehicle and driving conditions.

This information is as said experimental, and will always be. Because driving conditions change so much, drivers and driving habits change, not to mentioned the

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wide range of differences from one model to another – even from the same model last year to this year. We'll never be able to calculate for sure what a Mazda 626 will do uphill in North Dakota will do for the Gallon when it has 120,000 miles. Who's the driver? How much wind? You get the point. But the additive formulas DO give us, for every car and driver, a **clear starting point** – as well as a definite **range of blending ratios**.

Yes, and one last thing regarding additives...although these formulas have been tested for thousands of miles by many drivers, we are just now starting to see what they will do for HOD vehicles, especially Water4Gas. It would be HIGHLY APPRECIATED and helpful to all Water4Gas experimenters to know what results you get, so please report with your car model/year and location. Thanks!

A2X10 (Acetone 2, Xylene 10):

PART 1 – balance of parts	PART 2 – how much in tank
• 2 parts **Acetone** • 10 parts **Xylene** • **Torco GP-7**: zero to **3-15 DROPS***	Gasoline engines: **12 oz. per 10 Gal.**** Diesels: **8 oz. per 10 Gallons**

***** That's 3 to 15 drops of GP-7 into the full tank of the car. Start **without** GP-7. If you're getting better results with this formula compared to the previous ones, AXG7 or AXG7-TS, try now **with** GP-7 in small quantities of a few drops per tank. Stick with what works best for you.

** Sounds like a lot? Look here: A2X10 roughly calculates to cost around $0.06/oz or **$0.75** per 10 Gallon. That's when we eliminate the GP-7 which is quite expensive. Compare that to AXG7 formula that came out as $0.58/oz or $1.75 for 10 Gallon. Much cheaper now (less than half actually), and I hope it works better for you. At the time of writing (August 13, 2007) I haven't finished testing but it seems like this formula works well for my Corolla.

> NOTE: Sometimes using 2-3 tankfuls of gasoline (per formula) is necessary to see a rise ***or drop*** in mileage, since the vehicle "remembers" the previous formula.
>
> So don't change abruptly or expect a formula to work or change overnight. Give it time to sink in (or out, if you remove one). The best way is to let the vehicle "forget" slowly over a tankful of straight gasoline (no additive formulas at all), then resume with the new formula.
>
> You can also save money using this phenomena: **add your favorite formula once every SECOND refill.**

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HOW TO MIX ADDITIVES AND HOW TO POUR INTO THE GAS TANK

If you have hardship getting the additives, or their combos that you have mixed beforehand, into the fuel tank, here's a method I use:

- I use a simple measuring cup from Home Depot, that costs about $2. It is made of some durable plastic that has never melted or deformed in two years of usage with acetone and xylene. If I'm not mistaken the size is 1 quart.

  Another helpful and safe measuring AND MIXING tool is a 32 oz 2-stroke oil mixing bottle, which you can also use to accurately blend various fuel mixes. Get one of these bottles from most 2-stroke oriented shops: motorcycles, snowmobiles, etc.

- I used a permanent marker to draw "ounce lines" on the outside of the measuring cup or bottle. I marked 2-ounce, 4-ounce and 6-ounce lines that are most useful for me.

- Fill in the gasoline first, then pour the additive mix using a long funnel. TAKE CARE NOT TO SPILL ANY OF IT ON THE PAINT OF YOUR CAR!

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ZERO-POINT ENERGY FUEL ADDITIVE???

FUTURE SPECULATION - YOU MAY SKIP THIS PAGE. I'm testing a little-known type of fuel additives, that works on...well kind of nano-level. There's a material called Polyisobutylene or PIB, sometimes also called "butyl rubber". PIB was actually developed back in **1937** by Standard Oil (now Exxon). It's a **synthetic rubber** with many uses: adhesives, agriculture, personal care, lubricants (liquid PIB) and even chewing gum! (solid PIB).

Zero-Point Energy (see def.) is beyond the average education level - mine included - so let's compare its operation to something much more familiar: homeopathic medicine. This medicine, that has been rejected and ridiculed for many years, is now well-known and approved as workable medicine. Its remedies are prepared by diluting a substance in a series of steps (diluted and then a sample of the already-diluted liquid is diluted again) until it's diluted by as much as 20,000 times or even 100,000 times, total. Many homeopathic remedies are so highly diluted that no molecules of the original substance are likely to remain after dilution! Yet they affect the body, even better than in larger doses. Amazing, yet it works whether you believe it or not.

Likewise, imagine a fuel additive so powerful, that TRACES of it in gasoline are enough to do the effect of its undiluted big brothers. A few drops per tankful of gasoline, or in other words dilution ratios starting in the high range 10,000 – down to as little as 1 part of this stuff to **10 million parts of gasoline** (not a typo!)

I'm still experimenting and will let you know when I have first-hand results. I already know that this substance is very expensive per gallon. But since so little of it is needed, it's actually cheaper than other additives. I know it's valid because US Patents have been issued for it, and they don't give it a patent for nothing. However the PRACTICAL question is: does it work in modern vehicles – or is it based on ghosts from the past? I'll let you know. Meanwhile, the formulas above are great and will always be great since they are not dependent on unique/patented sources.

Here's a little story: Recently there used to be a PIB-based product on the market. The product was called Viscon, it was made for a while by GTA Technologies (www.gtatech.com) and was said by WikiPedia to "dramatically improve the uniformity of the air/fuel mixture in internal combustion engines." The media was raving about it and has created expectations...

Now it disappeared. At first the website said "this product is not available for retail", making you think that if you were a distributor, they'll gladly talk to you. Nada. After a short while they disappeared altogether, and their few distributors "ran out of stock."

Oh well.

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GST #9: NEW FILTERS

When you use Acetone, Xylene or AMSoil's 'Performance Improver' (P.I.), you may also need to change your oil filter after your first 3-4 tanks if you notice a drop in mileage. That's because these products have the power to clean up gunk buildups in the tank and fuel system - which will naturally end up in your fuel filter.

In my estimation you will not have to change the filter frequently after the first cleanup. Actually with the techniques offered in this book, junk such as unburned fuel will be less likely to develop/accumulate, and the little that will develop can now be filtered out by the PCV Enhancer (see chapter).

Also Recommended: install a new and improved air filter such as AMSoil's PowerCore air filter, as well as a high quality oil filter such as AMSoil or Donaldson:

For proper filter selection (AMSoil and Donaldson generally recommended, see photos above) visit www.amsoil.com/products/oil_airfilters

The bigger the filter the better. That is, when you compare a large filter from a good brand to another good brand but smaller. I'm not saying take a crappy no-name just for its size. But do try to fit the largest filter that will fit your engine. It's a long term investment of a few extra dollars, that pays off $100's if not $1000's in maintenance savings.

Also make sure the replacement filter has an "**anti-drainback valve.**" The purpose of this valve is to retain oil in the filter for quick dispersion to the upper part of the engine, the part which is furthest from the oil pan (bottom of engine) but needs quite a lot of lubrication. This too will pay you back nicely in reduced maintenance.

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GST #10: HIGHER OCTANE VS. ETHANOL, AND OTHER GAS TIPS

HIGH OCTANE GOOD, ETHANOL BAD

We recommend that you consider using a higher octane gas even if your vehicle is not designed for it. I don't know what you drive and this is a general advice only. The Federal Trade Commission (FTC) www.ftc.gov/bcp/conline/pubs/autos/octane.shtm advises that higher octane fuel is a waste of money. Maybe it is – test it out as an ADDITION to water4Gas tech and see what happens. Results will vary from car to car, state to state and even from one gas station to another. If for instance it saves you 8% but costs 10% more, skip it.

But even the FTC admits that higher octane does contribute to preventing knocking. In any case hold this in mind: **ETHANOL or "E85" is a a pure WASTE OF MONEY. It has 2/3 the energy of gasoline and will decrease MPG in almost all vehicles!** Unless you own the Saab Aero BioPower concept car... which is specifically designed for ethanol. Only problem is, this car is so expensive that it will take a lifetime to earn back the fuel cost savings :-)

NOT ALL GAS STATIONS ARE CREATED EQUAL

Try not to refuel in gas stations that have the "10% Ethanol" sticker on the pumps. In Southern California where I live and travel it is hopeless because all gas stations have ethanol. BOOH!

What the heck is ethanol? Also known as ethyl alcohol, drinking alcohol or grain alcohol, ethanol is a flammable, colorless, slightly toxic chemical compound, and is best known as the alcohol found in alcoholic beverages. Produced today from corn as a common fuel additive, enforced on drivers across the USA and other locations as an "improvement" to gasoline. It is very bad both for gas economy of the individual AND to national economy, since its low energy efficiency requires us to import MORE petroleum for every gallon ethanol of we use. PER GALLON, IT HAS ONLY 2/3 OF THE ENERGY OF GASOLINE. Find all the (stinking) facts about ethanol by visiting www.zFacts.com

Some stations, such as Mobil in my town, don't bother to have the ethanol sticker anymore. It took several phone calls to Mobil's corporate office to find out that they do have ethanol, and a lot of it.

I have found that "76" have only 5.6% ethanol and therefore provide the best miles per dollar, per my evaluation and per the experience of my mechanic. Anyway you should do the same – pick up the phone and ASK the gas company how much ethanol they add in your neighborhood.

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Also, use GST #3 (scanners) to measure the effect of each gas station. That's because refineries have play with something like 130 additives to create soup-like recipes. Some of their recipes may be bad (as far as fuel economy) for all vehicles in general – or to your vehicle in particular – and the only way to really tell is to test.

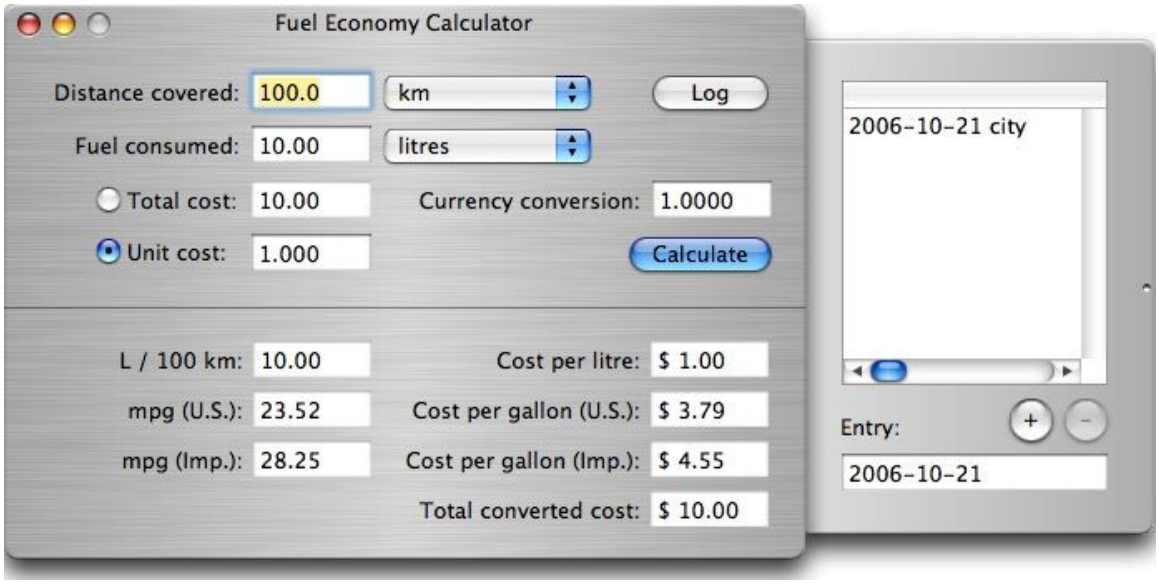
THE "SCIENTIFIC" APPROACH

The word 'scientific' is derived from the Latin word 'scio' which means to know, to understand. If you want to be totally "scientific" about gas stations and octanes, which is to say you want to know the exact MONEY VALUE of every drop of fuel you put in your tank, here's a simple formula I have developed for your use.

This formula calculates the relative value of your gas investment. The lower the number, the better the deal is for you. It does not matter if you pay per gallon or liter, it does not matter if you pay for fuel with American Dollars, French Francs or Norwegian Kroner. It also does not matter if you enter your mileage is expressed in Miles per Gallon or Liters per Kilometer. As long as your calculations are consistent, you'll be comparing apples to apples. All you're interested in is COMPARATIVE numbers to help you choose the best gas pump in MONEY VALUE.

As far as this approach goes, ignore most "fuel economy calculators" available online, simply because they all ignore the price of gasoline. Let's say for example the new miracle gasoline "Super-Duper-Blah-Blah" gives you 20% better mileage, but costs you three times as much as "regular". It's obviously not worth it, is it? The calculation formula below will simplify the mathematics for the not-so-obvious cases.

I have found one rare case of a good computerized calculator, unfortunately for Apple computers only. Download from http://home.cogeco.ca/~ekchew/fecalc/



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The formula is very simple:

$$\textbf{Gas Economy, its Money Value} = \frac{\textbf{(Distance driven) x (Price per Gal/Liter)}}{\textbf{Fuel consumed}}$$

The lower the number, the better the deal for you! Again, the result cannot be expressed in MPG or anything else that's globally known. It will only give you a number that's comparable **to you** and possibly to other "mileage seekers" in your country, provided they are using the same measurement units and currency.

GAS PUMP TIPS & TRICKS

1. As temperatures rise in underground storage tanks, gasoline loses energy, but fuel prices don't flex to compensate the consumers.

   Fill up your gasoline tank in the morning or dawn when it's cool. That's because gas stations have their storage tanks buried below ground; and the colder the ground, the denser the gasoline, so you'll be getting more mass of gasoline per gallon.

   This not an urban legend! An article published in the **Los Angeles Times** on August 22, 2007, reported of recent tests by the California Division of Measurement Standards. They found evidence to the allegation that consumers are being shortchanged by gasoline retailers and the oil industry, amounting to an annual $2-billion rip-off nationwide ($700 annually for a large truck). Read the full article at http://www.latimes.com/classified/automotive/highway1/yourwheels/la-hy-wheels22aug22,1,1193672.story?ctrack=1&cset=true

   Actual temperature fluctuations are small (due to the thick walls of underground storage tanks) so they don't make a dramatic difference, but it adds up and it doesn't cost you anything to use this tip.

2. If a tanker truck is filling the station's tank at the time you want to buy gas, do not fill up; most likely dirt and sludge in the tank is being stirred up when gas is being delivered, and you might be transferring that dirt from the bottom of their tank into your car's tank.

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GST #11: DUAL-EDGE MAP SENSOR ENHANCER (DEMSE)

CAUTION: This device may be used ONLY in conjunction with an Electrolyzer (HHO device) or a Vaporizer (H2O device) installed and functional.

ALTERNATIVE ENHANCER

A recent addition, this enhancer worked much better (in OBD-II tests) than the O2 Sensor method. The O2 Sensor method, on the other hand, worked great on OBD-I. Too early to withdraw absolute conclusions, but this is what indicates at the time of writing.

A STUPID LITTLE RESISTOR???

Let me start with a limiter: THIS DEVICE IS EXPERIMENTAL AND HAS WORKED ON OBD-II. It has been reported to also work on OBD-I. I don't think it works well for MAF (Mass Air Flow) sensors or Oxygen sensors because those rely on **frequencies** while this is a direct current device.

Now let's define some words.

When we say the word "computer" in reference to the fuel and emulsions control system, we're generally referring to the ECU or Environmental Control Unit. It is also sometimes called the PCM or other names. So we may be using the word computer and ECU interchangeably, although some cars have more than one computer. The ECU is what we're interested in when it comes to saving energy.

OBD means On Board Diagnostics – basically the engine computer system and a dictated set of performance sensors that are **mandatory** on all cars since 1996. OBD-I is pre-1996. Now we have OBD-II. They say it is mandatory for emissions control. I have come to realize that it's for the purpose of wasting gas. This "modern" system uses gasoline to cool down the engine and "control" the emissions, when patents and technology have been in existence for a century now to do all that without wasting energy (deteriorating the planet) and without building up sludge (aging your car real fast). Thus from now on say OBD means On Board BS.

"Potentiometer" (or "pot") simply means variable resistor. For a long while I've been hearing about the use of some "resistor" to lean out the mixture. I've heard it was being sold on eBay and thought it was too good to be true. Because if it is so simple, then why do we need EFIE or D17 (various electronic devices that change or "translate" the pulses of the O2 Sensors)?

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Well, I'm not at all sure **why** we need the complicated stuff... I tried this simple device here in a vehicle running OBD-II and it worked better than expected.

While driving at 55 MPH I have dialed the MPG gauge up by as much as 77% just by turning the knob way down. The latest test results have averaged 59%.

BACKGROUND OF THE INVENTION - WHY IS THIS NEEDED

The simplicity of the background is this: we're using what some people refer to as "watergas technology". Electrolyzers, water vaporizers, water injectors, hydrogen generators of all sorts and colors. As far as I know everybody in the industry shares the same problem on modern computerized cars, and here's a typical story: somebody installs a device and enjoys better fuel economy for a few days. Then after maybe half a tank or so, he calls or emails the developer and says: "Hey listen – your device stopped working – I'm losing mileage. I can see the bubbles coming out and all, but the performance has dropped!! I am losing the gains I had!"

You know what it means when somebody is losing gains he's already got? It means there is some freaking suppression on the area! It needs to be detected and removed, either by handling or by disconnecting from the source of suppression. Same here. Now let's get purely technical and examine what happens.

You have enriched your car with something fantastic – water power of some sort. Hydrogen, water vapor, or both. As your computer senses a richer fuel it then reduces the amount of fuel being consumed, because you're already running rich. So far so good because you don't need as much fuel as before.

Now the problem shows its ugly face when we discover that the computer – your vehicle's computer – has been pre-designed to protect the vested interest of those who would like to see you waste fuel like crazy. While pretending to be your friends. This is an unproven theory of course, but your computer figures out that we've been enforcing fuel economy for a while and it says: "Wait a minute - somebody is probably doing something fishy here" - and it switches your car into "Limp Home" mode which means, between other things, a constant-rich (wasteful) mixture.

What just happened? You've been enjoying good fuel economy for a while, but all of a sudden your gains are dropping and in some cases even going negative. That is, worse than before the installation. You computer has said: "Sorry buddy, we've just caught you cheating and we can't allow that."

Here comes the counter-measure. Several inventions exist to lean the usage of gasoline back to where it was before you've lost gains, and in most cases even much better. The invention we're presenting here is not the only one, but is among the simplest.

We're going to use this invention to change the set points so that the computer is still active in "closed circuit" or "closed loop" mode. That is, it still senses the car's performance and it still controls the consumption of fuel as needed every little moment of driving – **but the difference is that now we have totally changed the set points in your favor!**

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Now you are going to enjoy the mileage gains and you'll get to KEEP THEM for a very long period of time.

HOW DOES THE MAP SENSOR WORK?

The Manifold Absolute Pressure (MAP) sensor signal is electrically used in a similar way to the use of Mass Air Flow (MAF) sensor signal (although internally it is built differently). It takes a 5 volt signal from the computer, and returns a lower direct-current signal in accordance with the vacuum in the engine. A higher output voltage means lower engine vacuum, which is then calculated as "more fuel is needed". Lower output signal indicates higher engine vacuum, which requires less fuel.

It's not just fuel control though. The MAP senor signal gives the computer a dynamic indication of engine load. The computer then uses this data to control not only fuel injection, but also gear shift and cylinder ignition timing. In some cases it is even used to calculate changes in barometric pressure, to automatically adjust for different altitudes.

HOW DOES THE MAF SENSOR WORK?

The Mass Air Flow (MAF) sensor helps the computer to calculate the flow and mass of the air entering the engine. It does that by measuring the cooling effect of air flow over a heated wire element. The electronic circuit inside the sensor attempts to keep the sensor at a fixed temp. When it is cooled more by an increased air flow, more current is needed to maintain a constant temperature. The increase in current is converted into a signal and that signal goes to the computer. In most cars this signal would be a high frequency signal. Not as high as a radio wave, but much faster changing than the (relatively) slow frequency of the Oxygen sensor.

During low air flow rates, such as at engine idle, the MAF sensor produces a lower frequency signal. During high air flow rates, such as at wide open throttle-road load, the MAF sensor increases the frequency. The control module then converts these frequencies into their corresponding Grams-Per-Second values.

Yet again, some MAF sensors may work on a straight DC signal 0-5Volts such as the typical MAP sensor. This is the case in some older MAP Sensor designs that have a trap door with a potentiometer connected to its shaft.

For better understanding of air flow sensors read this document:
http://www.autoshop101.com/forms/h34.pdf

I'm giving you these descriptions so you can understand how to apply the correct circuit to each sensor. I don't think the pot arrangement can do if all you have is a MAF sensor or if the MAP sensor works with frequencies (very rare). If this is the case, employ the Oxygen Sensor device called EFIE from www.Eagle-Research.com

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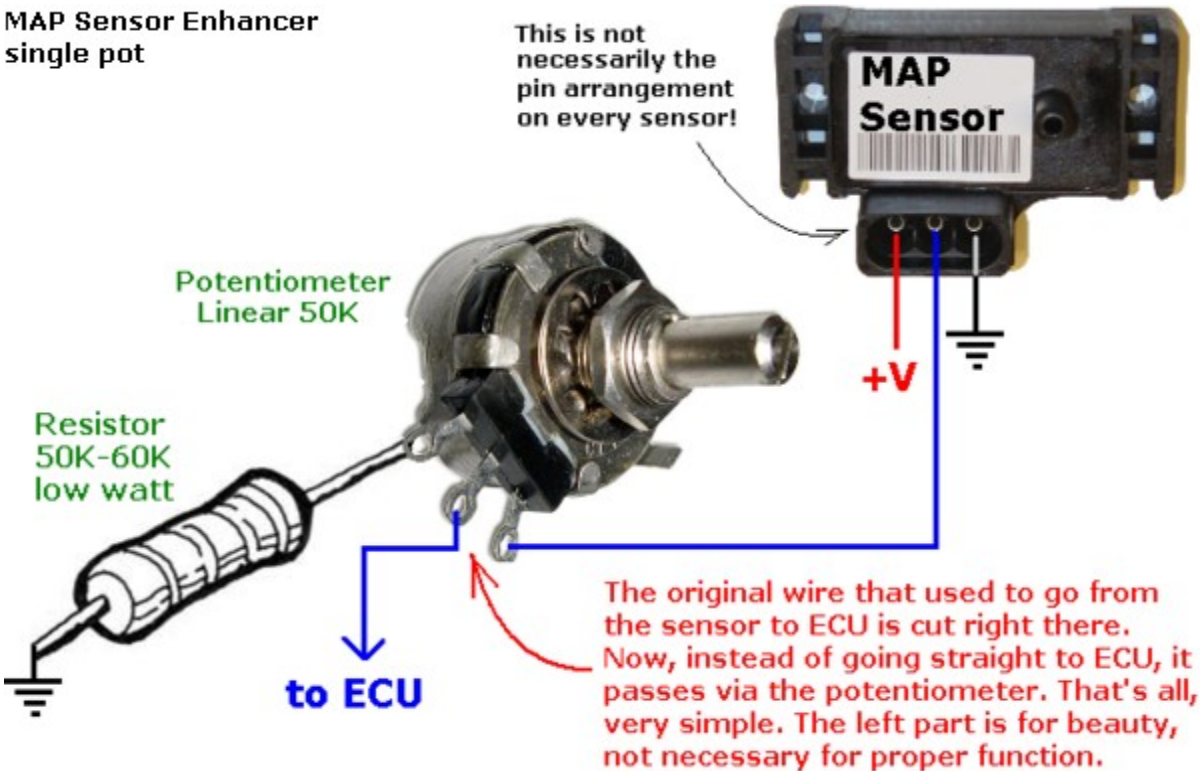
THE ENHANCER

The invention we're talking about here is a simple play with resistors. A resistor is a little piece of carbon that somewhat blocks electrical current. Higher value means it resists more. The potentiometer ("pot" for short) is a resistor, a variable resistor, which varies its value by turning the knob. But it is still only a resistor. There is another resistor, a fixed value resistor, in series to the pot as shown in the diagram below.

The MAP or Manifold Absolute Pressure Sensor is a little though expensive device installed in your intake manifold, or installed on the firewall and connected to the manifold with a thin hose. It has 5 Volts or 12 Volts coming in, and it simply senses the vacuum in the manifold and attenuates (reduces, weakens) this incoming voltage by a certain factor. In other words it reduces the supply voltage to a direct-current voltage in the range of 15% to 60% of the supply voltage (depending on the car's design these numbers will vary), and this varying (but non-pulsing) signal is then sent back to the computer.

The arrangement of resistors simply takes this already attenuated (reduced, weakened) signal – and **attenuates it further**. Too much attenuation kills the engine, it will simply shut off. Yet if you control it correctly you can lean down the mixture from the stoichiometric (a big word that simply means "balance of ingredients") which is factory set at 14.7:1 (14.7 parts of air to 1 part gasoline) – down to 20:1, maybe even 50:1 or 100:1.


MAP Sensor Enhancer
single pot
This is not necessarily the pin arrangement on every sensor!
MAP Sensor
Potentiometer Linear 50K
+V
Resistor 50K-60K low watt
to ECU
The original wire that used to go from the sensor to ECU is cut right there. Now, instead of going straight to ECU, it passes via the potentiometer. That's all, very simple. The left part is for beauty, not necessary for proper function.

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This device is totally passive and will work just the same if the signal coming in is 12 volts, 5 volts, or whatever comes on the line. The diagram here is the SIMPLEST way of doing this. The line from the sensor to the ECU is cut, and you place a pot on the line as shown. Further below you will see the improved enhancer based on the same principle.

INSTALLATION AND TUNING

ATTENTION: The tuning procedure calls for clockwise and counter-clockwise rotation of the knob. In some of the drawings the shown connections will result in opposite rotation. The solution is to swap the connections of the SIDE wires going to the pot (not the wire in the middle). The last drawing in this chapter shows the "correct" connection on both pots. By "correct" I mean it will have full rich in the counter clockwise end and full lean in the clockwise. The idea is that turning clockwise will "enhance" the more you turn. But it's up to you.

The potentiometer can be installed on the dashboard. To eliminate the work and possible damage to the dashboard, and to enable me better control, you can build this into a small mobile box and place the box beside the driver seat. It makes tuning quite effortless.

(The markings "Highway" and "City" shown for example only)

Now locate the 3 wires connected to the MAP sensor. There will be one for the positive supply voltage, usually 5 or 12 volts but it does not matter. The signal will be the one with the WEAKER voltage, and will change with RPM if you start the engine. And there will be a ground wire. You can solder or crimp electrical wire connectors, so you can always hook it back to factory setup. But I doubt if you'll ever want to go back!

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If you cannot locate the sensor or the wires, or you're not sure, you'd better get the car's manual. DO NOT IMPROVISE OR GUESS – you may damage your computer. All I had to do at my (low) skill level was to walk into AutoZone and purchase the maintenance manual (Haynes) specific to the fuel injection system of my test car.

Two users of this method have advised me that one should also **disconnect the plug of the upstream oxygen sensor** (i.e., the one closer to the engine). The idea is that otherwise the computer will eventually lock in constant-rich mode again.

Now for actual tuning on the road.

1. Turn the knob all the way to "rich" (it should be fully counter clockwise if you hooked it as shown in the last photos of this chapter). This will be factory original.

2. Make sure your water device is operational. Warm up the engine and drive a while before messing with the knob.

3. DO THE NEXT STEP WITH CARE – ON A SIDE ROAD - JUST IN CASE YOUR ENGINE STOPS UNEXPECTEDLY.

4. Now start turning the knob clockwise, the mixture will turn leaner and leaner until the car stalls or bucks as you drive. Back the knob off slightly after the bucking and chugging.

5. Keep the danger of overheating in mind. If your Water4Gas device is non operational temporarily, set the enhancer at or near original factory setting (rich).

6. Another thing I've noticed is that set points change from one gas station fuel to another, weather conditions, cold engine, etc. The differences are not large, but if you're on the edge then the car will buck or vibrate and you'll need to change the set point a bit. Remember that this is a simple device. There is no point in computerizing it, it will require a whole new programmable ECU which is a very costly thing for most drivers and countries.

7. NOTE: When this device turns on the "check engine light", and it WILL do that, you can turn off the light using a ScanGauge-II (1996 cars or newer).

HOW TO MAXIMIZE YOUR BENEFITS

One recent set of road tests (6-16-07) averaged 52.4% better mileage. But tests from a week earlier on the same car averaged only 24.5%. Actually 22% if you count out idling. WHY such great difference?

The secret of the BIG DIFFERENCE between the two test groups: The later and more successful one got MORE THAN DOUBLE average gain, was because the MPG was not dialed to near choke point. It was about ¼ turn closer to factory setting! On the

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earlier tests I was choking the engine half to death. It reminds me of the greedy guy slaying the gold laying hen to get all the gold right now...

Each and every MPH readout was obtained by ScanGauge-II after (and only if) the readout has STABILIZED. My rules were strict: I wrote down a DEFINITE result only if there was a steady road condition where I could dial in a certain MPG on the enhancer (in enhanced mode), then switch back to original, back to SAME enhanced point (by an electric switch so I know it duplicates exactly), back to original. I let the readout stabilize in EACH mode. If the road was flat enough or steady uphill enough AND I could do it back and forth and still got the same numbers, I'd write down one line of results, and the speed I was in. Cruise control, never touched the pedal. Windows up, no air conditioner, no radio, nothing else changed.

MY CONCLUSIONS

Don't overwork the engine by leaning it too much – play around until you find the PERFECT BALANCE point. Leave it where at its best position.

Now there's a bit of a problem because the "best position" will vary by driving area and environmental conditions. I have found that there could be two or even three points that you want to be set at:

1) Absolute maximum gas savings for highways.

2) A bit less than that for city driving, because you'll need extra power to start off after each stop.

3) Possibly you may want to switch back and forth between full rich and full lean (maximum lean that doesn't kill the engine and doesn't cause bucking or vibration) mixture, so you can compare the effect of the enhancer. That's what I used to get easy readouts in my tests.

THIS IS MY OWN CONCLUSION. I am willing to be proven wrong, but so far the results indicate that this principle can work in your favor. One last note, I studied other solutions and methods. I believe they are of some benefit, but they are mostly VERY complicated, far beyond the scope of our philosophy of keep-it-simple (and affordable) .

MARKINGS

The "city" side is identical to 'highway". There are several ways to use the device. For instance you can mark one side as "enhanced" and the other side would be marked "original" (in which case you leave that side at full-rich position) so now you can switch between enhanced mode and original factory setting. Or mark them "hot engine" vs. "cold engine", or "bypass/uphill" vs. "flat road" - or whatever suits your use and driving conditions.

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TROUBLESHOOTING

Watch out for mixed-up wires. It is not a complicated device, but its structure must be duplicated exactly. Especially note these points:

1. The potentiometers are wired in such a way that turning it counter-clockwise will ENRICH the mixture and clockwise will LEAN the mixture. If you get anything else, check the wires per the diagram above. Also refer to the photos below.

2. The nature of this type of lever switch is that the right-hand pot is actually the "highway" adjustment, and the left-hand pot is the "city" adjustment. Observe the photo below - see how the wires are crossed to the switch? (Otherwise the knob/switch arrangement would be confusing).

3. Fixed resistors of 33K worked fine in my experiment. Your engine may be different. Any similar value will work, but the idea is that this resistor is calculated to enable a larger active range of the pot's movement. Call or email me if this is not clear.

   This diagram below demonstrates the reason and usage of the fixed resistor. You may want to trim the value of your (fixed) resistor to a different value if the control range you're getting is not optimal.

NO FIXED RESISTOR FIXED RESISTOR ADDED

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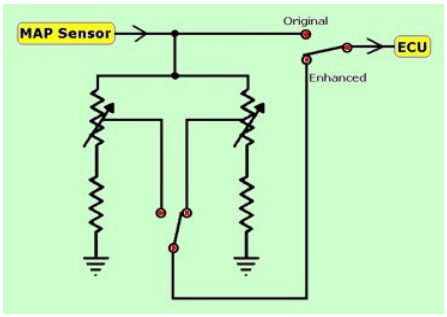
FANCY DESIGN

This may be going too far. Maybe not. But it is definitely a convenience to have TWO settings enhanced, and be able to switch back to original stock (factory settings) with a flip of a button.



In the device shown below which is a variation of DEMSE, the lower switch moves up-down rather than left-right, and toggles between "Original" and "Enhanced" modes. In Enhanced mode the upper witch toggles between the two knobs.

For instructions on how to replicate this design, see the User Manual (Book #1).

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GST #12: MAF SENSOR ENHANCERS

INTRODUCTION

The Mass Air Flow (MAF) sensor has many variations. All of them may be utilized for our purpose here. It may be named "VAF Meter" (rather than 'sensor'), and VAF may stand for Volumetric Air Flow, Vortex Air Flow, or Vane Air Flow, etc. Anyway this type of sensor helps the computer to calculate the flow and mass of the air entering the engine. It usually does that by measuring the cooling effect of air flow over a heated wire element. The photo below shows the elements of a common MAF sensor – note the brownish wires going across the openings. There are many types of sensor designs - your sensor might look completely different!

The electronic circuit inside the sensor (see photo, right side) attempts to keep the sensor at a fixed temp. When it is cooled more by an increased air flow, more current is needed to maintain a constant temperature. The increase in current is converted into a signal and that signal goes to the computer. In most cars this signal would be

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a high frequency signal. Not as high as a radio wave, but much faster changing than the (relatively) slow frequency of the Oxygen sensor.

During low air flow rates, such as at engine idle, the MAF sensor produces a lower frequency signal. During high air flow rates, such as at wide open throttle-road load, the MAF sensor increases the frequency. The control module then converts these frequencies into their corresponding Grams-Per-Second values.

Yet again, some MAF sensors may work on a straight DC signal 0-5Volts such as the typical MAP sensor. This is the case in some older MAP Sensor designs that have a trap door with a potentiometer connected to its shaft. Some work by a membrane action, some with cold elements sensing airflow by inductance (electric force field which builds up around a conductor).

I'm not trying to cover the entire theory here. For better understanding of air flow sensors read these documents:

- http://www.autoshop101.com/forms/h34.pdf
- http://en.wikipedia.org/wiki/Mass_flow_sensor#.22Coldwire.22_Sensor
- http://www.wellsmfgcorp.com/pdf/Counterpoint3_2.pdf

THE ENHANCER

To fully control the MAP sensor, I mean all the way down the air/fuel ratio, you need to gain control over the circuit, or otherwise translate its signal before it gets into the computer. There are ways to do that but are currently kept secret. If you must know, there are "MAF Tuners" sold online:

- MAFia MASS AIR TUNER - $190
- MAFXtender - $100

Now let's see if we can control the MAF signal using a potentiometer. It's going to be partially theoretical. I know a guy who rides his truck with this arrangement already in place, specifically the pot exactly as DEMSE above, on one of the wires coming out of the MAF sensor. He does not have a MAP sensor. Using my ScanGuage we have measured 25% mileage gain average highway AND city driving. So here is my theory.

The mechanic said he just measured the signals on the MAF wires and decided to use the one that changed between 0-3 Volt, rather than the wires that changed little or none. Clever so far. What did he do actually?

Trying to find a standard connection of MAP Sensors, I came up with nothing. Some have 5 wires, some 4, some use a 6-wire connector although not all may be in use. So what we'll do is I'll give you the theory and TYPICAL diagram, and you'll have to

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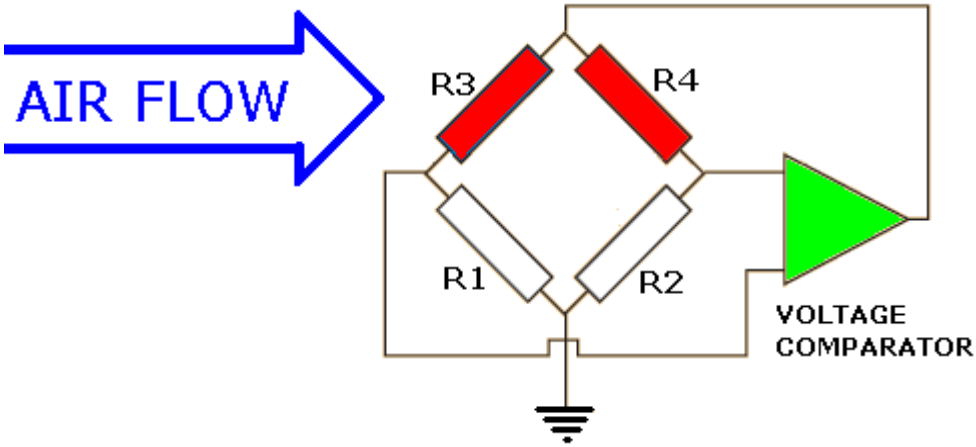
figure out which wire to cut by first measuring all signals and see which one changes most (wide range when you rev up the engine to different RPM levels).

The operating principle of a typical hot-wire sensor is based on two sensing elements shown in the diagram below as R3 and R4. These are metal film resistors which are are mounted in the air stream channel and are connected in a bridge circuit (the "bridge" is the 4 resistor arrangement). Sensing element R4 ("temperature compensation resistor") provides bridge tracking so that the flow sensing element R3 ("hot film resistor") is heated to a fixed temperature offset relative to the incoming air temperature. R1 and R2 are fixed resistor that build up the "bridge" configuration.



The Voltage Comparator tries to maintain constant current trough the bridge, and the electrical current required to maintain the fixed offset temperature of R2 (adding more current as airflow rises and cools down the resistor) indicated the amount of the mass airflow across resistor R2. The attached electronics transforms this signal into an analog (changing DC voltage) or frequency output signal that's delivered to the computer.

If you can dissect the sensor circuitry and locate the point between the bridge and the circuit that converts the analog voltage to frequency, you can use a DEMSE (potentiometer) to regulate this voltage. If not, measure the signals coming out of the sensor. As mentioned use the one that displays the most change on a digital voltmeter.

A diagram for a possible circuit is given below. I say "possible" because MAF sensors are so non-standard that all I can do at the moment is give you ideas to experiment with. So here are the steps I would take:

1. IF YOU HAVE a MAP sensor – by all means use it! See GST #11 (DEMSE).

2. If no MAP sensor, add the circuit shown below or hack into the sensor circuitry if you can.

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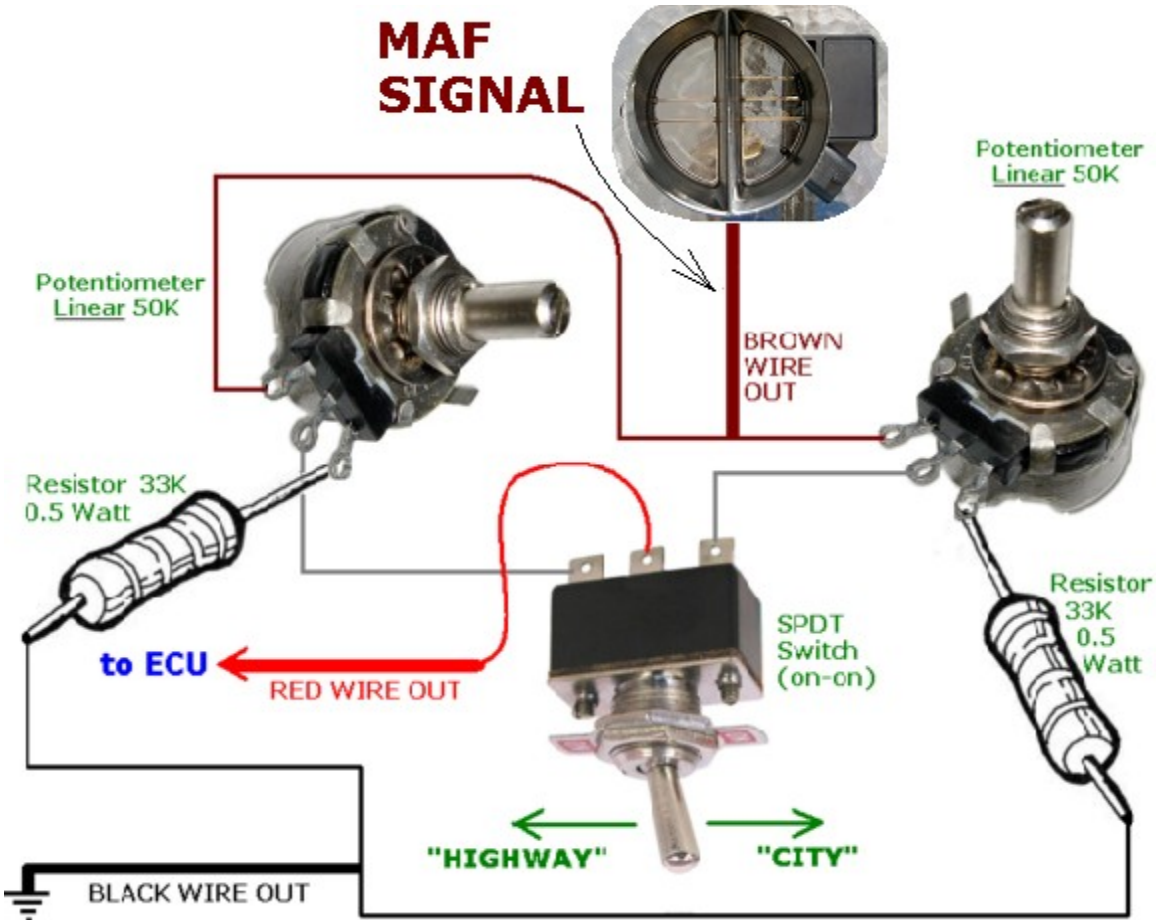
3. Once this works, test it. If you get MPG differences of 50% between full rich and full lean, you're good to go. You have full control over the mixture.

4. If you get change in the range of 15%-25%, I suspect that you have SOME control (which is s great start) but not all that is possible. Try GST #5 (Aluminum wrap) or GST #6 (EFIE).



MECHANICAL MAF SENSOR ENHANCER

An alternative to the electronic MAF Sensor Enhancer described above, is as mechanical enhancer, built on the idea of diverting some of the intake air. We don't change the MAF sensor. Instead, the idea is that **the diverted air will not be measured** resulting in a lower MAF signal. No electronics involved, you see?

Depending on the engine at hand, you will have to devise an **adjustable intake air bypass to the MAF sensor**. It will be easier to build in engines that are not compacted to such a point that you cannot stick a toothpick in there.

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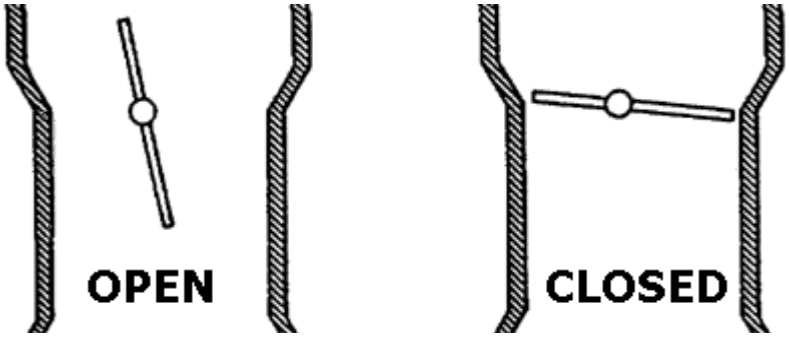
The simplest configuration is described below.

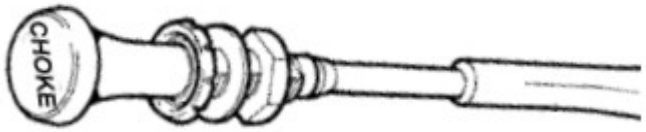
1. Locate the air filter box to which the MAF sensor is attached. The following diagram shows the air path from the filter to exhaust.

2. Drill a large hole in the air conduit leading from the location of the MAF sensor to the throttle body. The hole must be AFTER the sensor because the whole idea is to partially BYPASS the sensor.

3. Add a flap-cover. If space permits, instead of constructing a cover, attach an old motorcycle choke valve:



4. Connect it to a bicycle-type cable or better yet a complete choke cable (since it already has a knob and is readily designed for dashboard installation).



5. Install the other cable end onto the dashboard. If the dashboard is hard to open, add small board or bracket under the dashboard, within easy reach.

6. The air going into this contraption must be filtered.
   OPTION A: Attach an independent air filter to the open end of the choke valve, as shown in the picture below.
   OPTION B: connect a flexible air duct from the open end of the choke valve back to the air filter.

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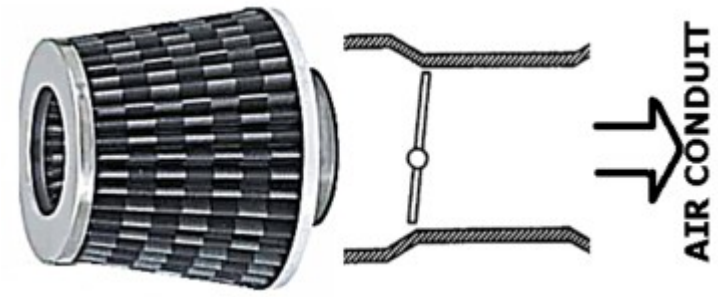
7. To compensate mixture changes in deceleration and idling, you can connect a separate spring-loaded cable to the throttle control arm.



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GST #13: FUEL HEATER

CAUTION:
This device may be hazardous if installed incorrectly. IT MUST BE INSTALLED BY AN EXPERIENCED MECHANIC.

INTRODUCTION

Our system is finally getting to maturity. A couple weeks ago I introduced the single Map Sensor Enhancer, now doubled and titled DEMSE. Now it's the fuel warmer.

Water4Gas Fuel Heater is no big news. It all started with similar technologies I've seen on the Internet. There was nothing wrong with them but the price. I didn't want to pay $220 for what seemed like a simple device. Even if I did, Water4Gas experimenters in poor countries would not be able to afford it with gas prices being double than USA and salaries as low as $400/month.

Another reason to keep it simple is that this device, by itself, will not make dramatic changes in fuel economy. A research I've conducted showed that although some $200 fuel heaters claim 300% increase in gas economy (where the hell did they get these numbers?) it adds only a few percents. It needed to be more affordable than current market costs of $170-$220, or we'd all skip it.

So I stepped into Home Depot and gathered a few hardware pieces from the Plumbing Department that seemed like they could do the job WITHOUT any special tools. So anyone in the world could replicate it using off-the-shelf items and pliers. These items are sturdy enough to survive the entire life span of the vehicle.

It was an immediate success. My mechanic approved the strength and feasibility of my design, and installed it for me in about half an hour.

The Fuel Heater should fit diesels and turbos as well, as far as I understand. I may be wrong. Consult your mechanic.

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I know all about the other designs out there. They are ingenious. But also expensive to make and hard to install. The idea here is to keep it **simple.**

ENVIRONMENTAL RESPONSIBILITY

Before we move on, let me tell you why I think every car and every car owner needs this device. There is excess heat from the radiator that is not just being wasted, it heats up the atmosphere. Why not take this heat and use it to warm up the fuel? Warm fuel will burn more thoroughly, which will lead to less emissions. **The environment wins twice!**

Therefore I believe that you should have this, although expected gas saving from THIS device is not impressive by itself. Fuel Heater will add a just few percent to the overall gas economy, but it will sooner or later pay for itself - while helping you to protect your environment.

I thank you for doing this because it is my environment too.

SAFETY FIRST!

Fuel will evaporate and create what mechanics call "vapor lock", but only IF you connect it to the exhaust or something really hot. This particular Fuel Heater installs on the radiator output (without cutting into it in any way) and the temperatures available there (normally 170-190) are about half of what's needed for instant evaporation. So it will pre-heat the fuel but will NOT evaporate it, therefore it is 100% SAFE.

So let's make it clear once more: **NEVER ATTACH THIS DEVICE TO THE EXHAUST SYSTEM!!!** Don't even think about it.

Do NOT use fuel injection hoses from the auto parts store or similar source – the hoses must be of the high pressure, high temperature type specified below. This is a critical safety point because the regular fuel hose may swell and/or crack under the high heat and pressure developed by the Fuel Heater. SOME PEOPLE SAY USE HYDRAULIC HOSES – but from Goodyear and other hydraulic supply companies I have learned that hydraulic hoses are only capable of handling occasional short-time fuel passage, NOT continual flow.

IT IS NOT SAFE TO USE THE FUEL HEATER ON CARBURETOR-EQUIPPED CARS UNLESS THEY HAVE AN ELECTRIC FUEL PUMP. I still don't know why but I'm searching for the answer.

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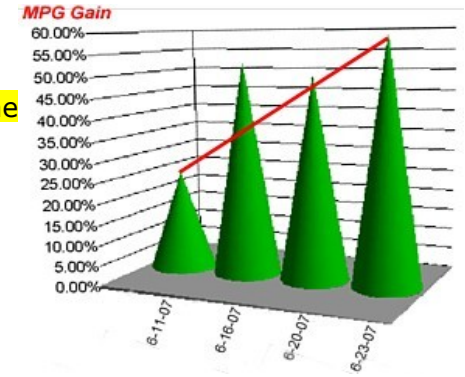
ROAD TESTS

Road tests with the Water4Gas Fuel Heater **AND Xylene (3 oz for 10 Gals)** in the fuel tank showed a significant rise in MPG gains to 59%. I estimate the added 9% is more due to the Xylene, and the Fuel Heater added something unknown to the soup. Maybe 3%. I am measuring the gain for each piece of road between MAP Sensor enhancer engaged/disengaged. ScanGauge-II gives me immediate readouts.

- Road tests 6-11-07: daily average **24.5%**
- Road tests 6-16-07: daily average **52.4%**
- Road tests 6-20-07: daily average **50%**
- Road tests 6-23-07: average w/HHO+Xylene **59%**



RECENT ROAD TESTS

6-23-07: all @55mph, cruise control, mild weather. w/XYLENE and Fuel Heater--the extra power allowed tuning the Map Sensor Enhancer further down (leaner) by almost ¼ turn.

The numbers are MPG readouts between full rich mode and lean mode, and the calculated gain per line. Each line means a separate stretch of road that had consistent results. If results were unstable for that road, they were not written down. Readouts were taken with my ScanGauge-II. Nobody tempered with the computer (ECU) or the ScanGauge.

First lot w/vaporizer, no HHO:
23.0.....25.8.....55.6%
60.0.....77.0 downhill....28%
27.0.....50.9.....88.5%
29.2.....42.3.....44.9%
32.3.....50.0.....54.8%

2nd lot w/HHO--avg improved from 54% to 59%
25.0.....42.3.....69.2%
9.6.....17.0.....77%
26.0.....42.0.....61.5%
21.0.....29.0.....38%
27.5.....45.8.....66.5%
25.0.....36.6.....46.4%
32.3.....50.0.....54.8%

INSTALLATION

Installation of the Fuel Heater is very simple but has to be done with care, so you don't create gasoline leaks. I will let the photos talk for now until I write a complete procedure. Basically you do the following steps:

1. Starting with an assembled Fuel Heater (hose extenders connected), place it on the radiator output hose.

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2. Release gasoline pressure.
3. Cut the original fuel line and connect it to the hose extenders.
4. Connect the Fuel Heater to the hose extenders.
5. Fasten the Fuel Heater to the radiator hose with black cable ties (the black ones are more durable and heat resistant).
6. Wrap it with aluminum foil (four or five layers) and fasten with cable ties.
7. Now wrap it all AGAIN with aluminum foil (4-5 layers) and fasten with cable ties.
8. For cold winters add one final wrap of pipe insulation cloth from Home Depot.
9. Secure the lines to existing engine hardware (such as existing hoses, metal parts, etc). Do NOT attach to hot parts of the engine! Also MAKE SURE THAT THERE ARE NO SHARP BENDS in the hose – hydraulic hose data sheets for NRP Jones specify a minimum bending radius of 4 inches. No minimum is specified for the 2231 hose (see parts list below), but we advise you to keep it 4" or larger if possible.
10. Start the engine and make sure you have no leaks. Better check again after a day or two of driving around.

The photos show an installation in a Toyota Corolla. Every vehicle will be different but these photos will help you get the idea. Don't use the Thermoid hose I used – use the hose specified in the parts list below.

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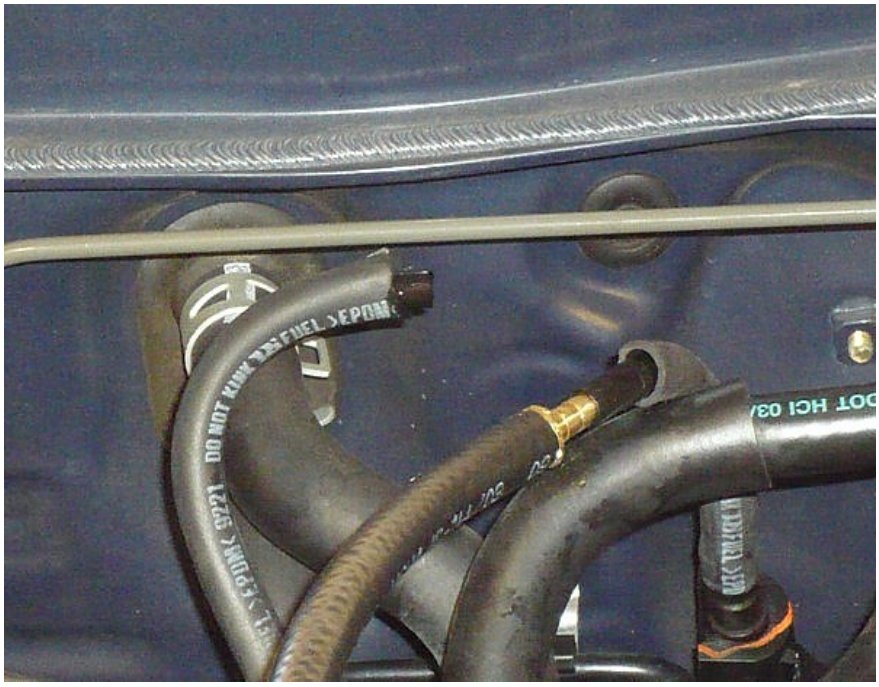
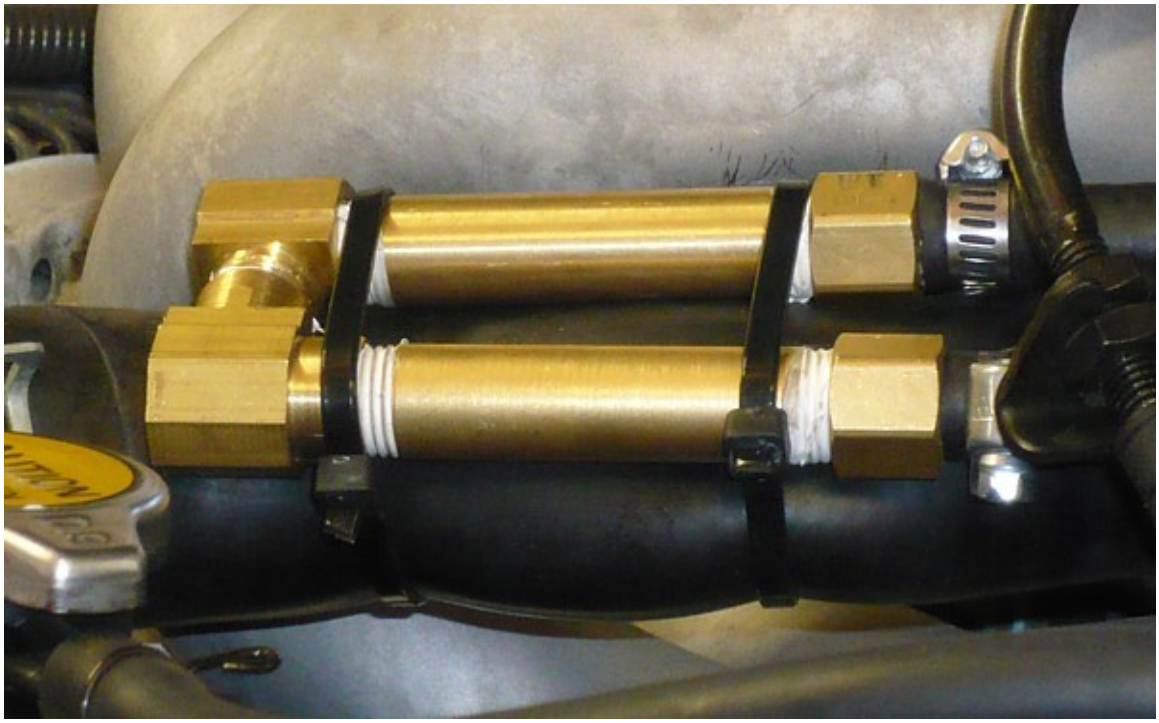


Thermoid® FLEX-LOC 300 NON-

Secure every connection.



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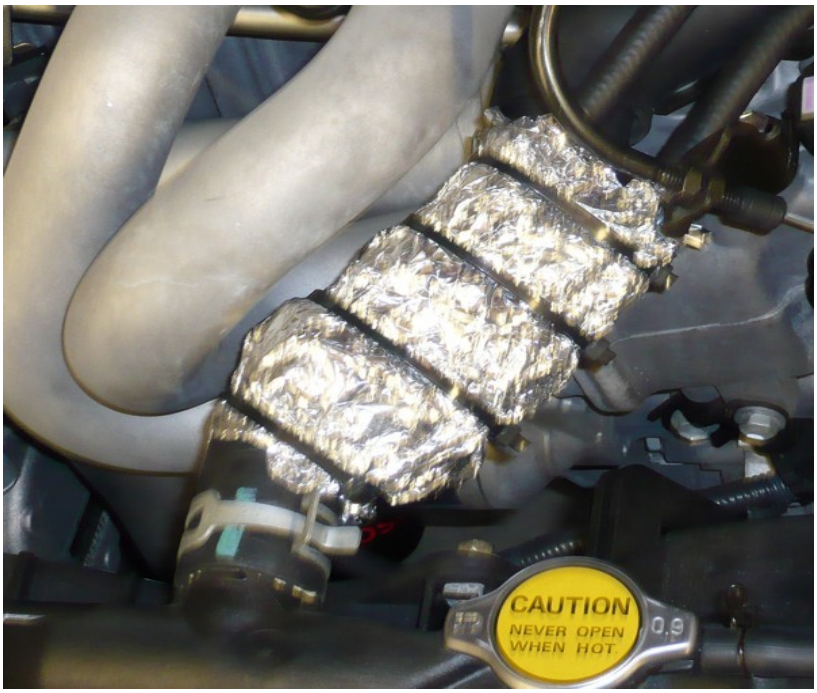
Now the second layer...



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Also recommended for older cars: a fresh fuel filter!

THIS DEVICE IS EXPERIMENTAL! Everything else is experimental too, but this one is very recent and not much is known other than (1) it's safe IF INSTALLED PROPERLY, and (2) it's very affordable. Try it out and tell us how this piece of technology works for your vehicle. Please be specific about your model and year, test methods, specific performance and mileage results, etc. THANKS!

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GST #14: PCV ENHANCER

BACKGROUND OF THE INVENTION

The PCV Enhancer has its roots in an old invention by an inventor unknown to me. It became widely known after the March 1992 publication called "PCV Jar" in KeelyNet.com, which was signed by Jerry W. Decker, Ron Barker and Chuck Henderson of Vangard Sciences, Texas. This publication has plugged this invention into the Public Domain - and into public awareness of the PCV problem - thus it has gained quite a popularity between mileage seekers (hey, I just found a great name for us).

WHY IS THIS NEEDED?

Many drivers and all mechanics are familiar with a device that has been with us since 1960's. It looks like this:

PCV = Positive Crankcase Ventilation. Wikipedia explains what PCV is, and the problem they're trying to solve:

"As an engine runs, the crankcase (containing the crankshaft and other parts) begins to collect combustion chamber gases which leak past the rings surrounding pistons and sealing them to the cylinder walls. These combustion gases are sometimes referred to as "blow by" because the combustion pressure "blows" them "by" the pistons. These gases contain compounds harmful to an engine, particularly

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hydrocarbons, which are just unburned fuel, as well as carbon dioxide. It also contains a significant amount of water vapor. If allowed to remain in the crankcase, or become too concentrated, the harmful compounds begin to condense out of the air within the crankcase and form corrosive acids and sludge on the engine's interior surfaces. This can harm the engine as it tends to clog small inner passages, **causing overheating, poor lubrication, and high emissions levels**. To keep the crankcase air as clean as possible, some sort of ventilation system must be present."

So that's the problem they are trying to solve. Only trouble is, they are trying to resolve it in a clumsy way. They take the crap out of the crankcase and RECYCLE it by feeding it back into the engine. If this was an organic body, I don't want to say what this parallels to...

The idea of the PCV Valve in your car is better than nothing, but not good enough. And that's where the PCV Enhancer can help:

1. It filters OUT the sludge. It keeps your oil, engine and spark plugs cleaner, thus allowing your engine to have a much longer life,
2. It condenses the water out of the crankcase where we do NOT want it.

If there are burnable gases flowing through, the PCV Enhancer is designed **not** to stop them but to allow them through, thus enabling a **better and cleaner recycling of gases**. Only oils, sludge and water will be stopped.

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This device requires maintenance – simply opening the bawl from time to time (recommended weekly at first) and emptying the water and oils that have accumulated. Unlike "historic" models made of metal, this one is transparent so you can see if cleaning is needed or not.

The small effort of cleaning will pay you back in:

1. Short term – **mileage increase** and further emissions reduction, and
2. Long terms – less maintenance and longer engine life.

My contribution, on 7/16/07, was to build a simple version of this device from Husky hardware sold exclusively at Home Depot. Not my idea, I've found photos on the Internet and imitated what I saw. But later that day I added 20 glass balls to act as a **gas condenser**. So now it's a **gunk filter** plus **gas condenser**, both extremely **simplified** in terms of self-construction, more durable and still as affordable as the original invention. Since it is quite different in structure from the original "PCV Jar", I decided to name this specific design "PCV Enhancer".

I wish to continue the same tradition so I'm placing this design totally in the Public Domain where it belongs.

STRUCTURE

The PCV Enhancer has a filter borrowed from the world of compressors and air tools. Since it's mass produced and can be found cheaply in all Home Depot store, it's a great building block. To this filter, made by Husky, you attach two 3/8" inlet and outlet ports also made by Husky. To that all you MAY add is a bunch of glass balls or metal balls (ball bearings or BB's) to act as a condenser. [BB: pellets for BB guns - in the US they are 0.16" steel balls, in EU they are 0.17" lead balls]

The idea behind the number of balls: if you use 8mm glass balls like mine, then 20 of them will fill up the space, so no rattling noise will be heard while the engine is running and vibrating. If you're not concerned with the rattling, you can reduce the number of balls. Remember that a number lower than 8 or 10 balls will condense less water in some weather conditions, while not many are even necessary in certain other weather conditions. Hard to tell, the only way to know is experiment.

To that you may one small thing which is some sort of a rubber cap at the bottom. This is needed since the filter is designed for POSITIVE PRESSURE. Try it our with your mouth and you'll find out that when you pressurize the filter AND the bottom valve is pointing upwards, the valve will lock! Otherwise – any other position of the valve OR VACUUM pressure – the valve is open. Which means you'll be losing vacuum which is not good for proper PCV function.

So add a cap, forget about valve position and remove the cap for draining. If you intend to drain by opening the entire bowl, the cap can stay forever.

One interesting and important feature of the structure is its materials. The upper parts are mostly metal, while the bowl is polycarbonate (clear plastic). The Husky filter is rated for maximum temperature of 125 degrees Fahrenheit. Depending upon distance from the engine and air flow through the engine compartment, ambient temperature may deform the device after a while. It is therefore recommended to

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locate it as far as possible from the engine (say 1½ -2 feet away from the PCV Valve) where there is enough air flow to cool it off below 125 Fahrenheit.

As for the temperature of the gases coming out of the crankcase, these may be hot. The only answer to this is that the filter is too cheap to worry about. About $11. When it is no longer good, replace it. The filter element is made of Zinc and is estimated to last longer than the plastics if handled with care, so you don't have to worry about replacing it (yet I believe it can hold for two years or more if installed away from engine heat as seen at www.condensatorsales.com/assets/images/94Celica_1point8_600.jpg). Just keep it clean by washing with alcohol from time to time. RUBBING ALCOHOL, NOT ACETONE – acetone will melt the plastics and make the transparent bowl foggy!

HISTORIC "PCV JAR" DOCUMENT FROM KEELYNET

Below is the original text from Keelynet. It may add some information that I haven't covered, or you may someday choose to build one of those "PCV jars". In any case I'd like to include it here so it doesn't get lost as a technology. Before the days of the Internet it was taken originally from KeelyNet BBS (Bulletin Board System), sponsored by Vangard Sciences, PO BOX 1031, Mesquite, TX 75150.

"There are ABSOLUTELY NO RESTRICTIONS on duplicating, publishing or distributing the files on KeelyNet except where noted!

March 28, 1992.

Here is a device that you can build that will improve your gas mileage by at least 25%, and also keep your oil, engine and spark plugs cleaner, thus allowing your engine to have a much longer life. The device can be made for a total cost of about $12.00, and about two hours of labor.

The device consists of a 1 quart jar, a small V8 fruit juice can or similar container, window screen, BBs', hoses, washers and clamps. The device is installed in between the PCV valve of your automobile engine and the vacuum source the PCV valve is normally connected to. The device condenses the oily vapors normally sucked into the combustion chamber as part of the pollution control systems, in a container of BBs', where the vapors condense around the BBs', and drain into the bottom of the jar. If you can find them, use glass beads the same size of the BBs'. I have been unable to find any, but I know that they are made.

Blow by gases, containing gasoline vapors, are drawn back into the engine for burning. Combustion efficiency is improved as a result of the oily vapors collected in the jar, rather than contaminating the fuel/air charge in the combustion chamber.

Obtain a 1 quart jar, preferably with a wide mouth. The wide mouth is necessary for the juice can containing the BBs' to fit in the jar. Being careful not to damage the sealing gasket of the jar lid, locate and cut a 1/2 inch hole in the very center of the jar lid.

Locate and cut another 1/2 inch hole midway between the hole in the center of the lid and the outside edge of the jar lid. At this point, the jar lid has two, 1/2 inch holes cut in it. Try to keep the holes neat without any excess metal protruding above or below the lid surface.

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Obtain a length of 1/2 inch, all threaded pipe, and 6, 1/2" nuts. I use the pipe and nuts, that are used in lamps and lighting fixtures, and buy it at lamp shops. Some of this pipe has a seam in it, which you don't want. This device must be air tight, as engine vacuum is connected. Cut 1, 2-1/2 inch length and 1, 1-1/2 length.

Cut the end with the pouring hole, out of the small V8 juice can. Wash out and dry the can. Cut a 1/2 inch hole in the center of the juice can. Using 1/2 inch nuts, and fender washers and silicone gasket sealer (you'll have to enlarge the holes in the washers to fit the 1/2 inch pipe), install the 2-1/2 inch length of pipe in the V8 juice can.

Leave about two threads of the pipe, showing down inside the can. Use the fender washers on both side of the juice can to provide support. This can will be eventually filled with BB's, and the washers are necessary because of the weight.

Take the 1-1/2 inch length of threaded pipe, 2 nuts and some silicone gasket sealer, and install in the hole of the jar lid, NOT the hole in the very center. Leave 2 or 3 threads of the pipe showing on the underside of the jar lid.

Back to the juice can. Cut a piece of aluminum window screen to neatly fit the inside of the juice can, and push it down into the juice can, leaving no gaps for the BBs' to roll into the threaded pipe. Fill the can completely, with copper plated BBs'.

Take another piece of aluminum window screen, and pull it over the end of the juice can, leaving about a 1/2 inch skirt of screen. Using a large worm gear type hose clamp, gently tighten the clamp, snugging the screen to the outside surface of the juice can. You have to be careful here. You want to tighten the clamp just enough where the juice can STARTS to deform.

Install this can full of BBs' in the center hole of the jar lid, using washers and nuts. Leave about 1/2 inch of space between the top of the juice can and the other pipe installed in the jar lid, to allow the blow-by gasses to exit the jar.

Install 1/2 inch elbow on both pipes protruding from the top of the jar lid. Install a 1-1/2 inch piece of pipe into each elbow.

Obtain 1/2 automobile heater hose, and connect the jar to the engine as follows:

* From the center pipe of the jar lid, connect to the PCV valve. If the hose is too large, use a worm gear clamp to secure the hose.

* From the other pipe in the jar lid, connect a 1/2 inch section of heater hose to the vacuum source of the engine.

MAKE SURE THAT THE JAR IS ABSOLUTELY AIR TIGHT ! ! If not, you will know what is meant by a vacuum leak.

Now for the hardest part: You want to locate a spot in the engine compartment to mount a 1 pound coffee can, in which to hold the jar. Try to locate a place where the hoses can be kept as short as possible.

Cut several holes in the bottom of the coffee can to let any water drain out that may get in the can after a hard rain or that you have driven through. Cut a couple of pieces of the hose to wedge between the coffee can and the jar, to

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keep it snug and not bouncing around.

To make this assembly blend into the engine compartment, paint the jar lid, juice can and the coffee can, flat black. Consider using hoses the same color as the other engine compartment hoses.

Depending on how far you drive, the jar will probably require emptying about once a month. Vehicles which are driven short distances and the engine never really gets up to maximum temperature, will require that the jar be emptied about once a week.

The jar will contain mostly water, as a result of condensation that takes place in the oil pan. The liquid in the jar contains unburned hydrocarbons, water and sludge. The liquid is also mildly acidic, as a result of the water vapor and the unburned hydrocarbons, combining. Some people have noticed a slight burning sensation, if the liquid gets on the skin.

About every 30,000 miles or so, wash out the BBs' with varsol to keep the passage ways open. Your engine will stay cleaner and last much longer. Some people have claimed they have gone 500,000 miles without a rebuild. Three hundred thousand mile claims are common. The most mileage increase heard, has been 40%. Twenty five percent is much more common.

You will not believe the sludge and "gunk" that builds up in the jar. I broke an oil pump shaft in an engine with 185,000 miles on it, and when the oil pan was pulled, there wasn't any sludge or buildup. I installed the jar when the engine had about 72,000 miles on it. Additionally, the emission test readings are much lower.

This is one project where you'll get a return on your money and efforts, very quickly.

Jerry W. Decker.....Ron Barker.....Chuck Henderson,
Vangard Sciences/KeelyNet

NO PATENT INFRINGEMENT

We did not get any direct communication regarding patent infringement. However looking at the discussion at http://www.gassavers.org/showthread.php?t=112 one might think that a certain company has been harassing "PCV Jar" makers for patent infringement(s) over their 'Condensator' product.

For your protection and piece of mind rather than my own, I did my own research on the subject and here's what I found:

- The CONDENSATOR www.CondensatorSales.com looks like a great product that in my humble opinion, well worth its price ($179 at time of writing) that can do a whole lot of good because as I said our vehicle's PCV system is only half-done.

- Elmer W. Bush (1923-2004) has been granted several patents that you can read on the US Patent Office website www.USPTO.gov (do a search by Patent Number):

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US Patent # 4089309 May 1978*
US Patent # 4370971 February 1983

*You may also find a re-examination of the first Patent, filed in July 1981, Patent Office document # RE30682.

- On this page www.condensatorsales.com/html/adsorbant_separator.html Bush explains how **silica gel** filling the filter body absorbs and separates vapors. Silica gel is a great idea because it absorbs a lot of junk – but can then be reused by heating it, which releases the absorbed junk. The temperature required for releasing absorbed gases is called "Regeneration Temperature" and is usually 250°-400° F. This "gel" looks like tiny beads rather than soft gel, because it's almost totally dry, only 5%-7% water.

- *How Stuff Works* website explains how silica gel works at science.howstuffworks.com/question206.htm
and *Wikipedia* does a great job too at en.wikipedia.org/wiki/Silica_gel

[source of photo: Wikipedia, cut and enlarged]

- If you search Google for this stuff, just for your information, seems like half the world spells it 'silica gel' and the other half spells 'sillica gel'.

- Now we're only talking here about adding a commercial Husky air compressor filter on a PCV line, and we do not wish to infringe on any US Patent(s), do we? Therefore I am not going to tell you that you can remove the single screw that holds the golden filter element from the Husky filter, and fill it up with silica gel beads.

  And I'm not going to tell you that you can get silica gel from the air compressor gentlemen at www.ecompressedair.com (bulk orange silica that costs more but is the most durable for under the hood conditions, sold bulk in 25 lb. Packs, $135, or in other words 1.12 **cents** per gram).

  I will also not tell you that you can obtain **Dri-Z-Air** refill packets (about $1.30) from Walmart, hardware stores, RV and boating stores. Also I will not tell you to get 3-gram packets from www.Amazon.com at **27 cents each** (3

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grams is enough to fill up the mini Husky filter we're using), or 25 grams for only $1 from www.eBay.com (that's half the price of Amazon, per gram).

Especially I am never going to tell you how to get them FREE by recycling silica gel packets that you get with shoes, purses, electronic products etcetera and are imprinted with "Silica Gel – Do Not Eat" (discard the paper).

- IMPORTANT – the way the Husky filter is designed, the air comes in and is circulated into the bowl, drops down and THEN enters the golden filter element f**rom the outside**, then goes up again from the inside of the filter element and exits toward the engine. There is a chance, therefore, that under high vacuum some of the silica gel could be sucked into the engine. VERY SIMPLE SOLUTION: SWITCH THE INLET AND OUTLET CONNECTIONS, THEREBY REVERSING THE ENTIRE AIR FLOW THOROUGH THE DEVICE. If you're not sure what I'm talking about, open one of them Husky filters and have a look inside – a single screw releases the filter element.

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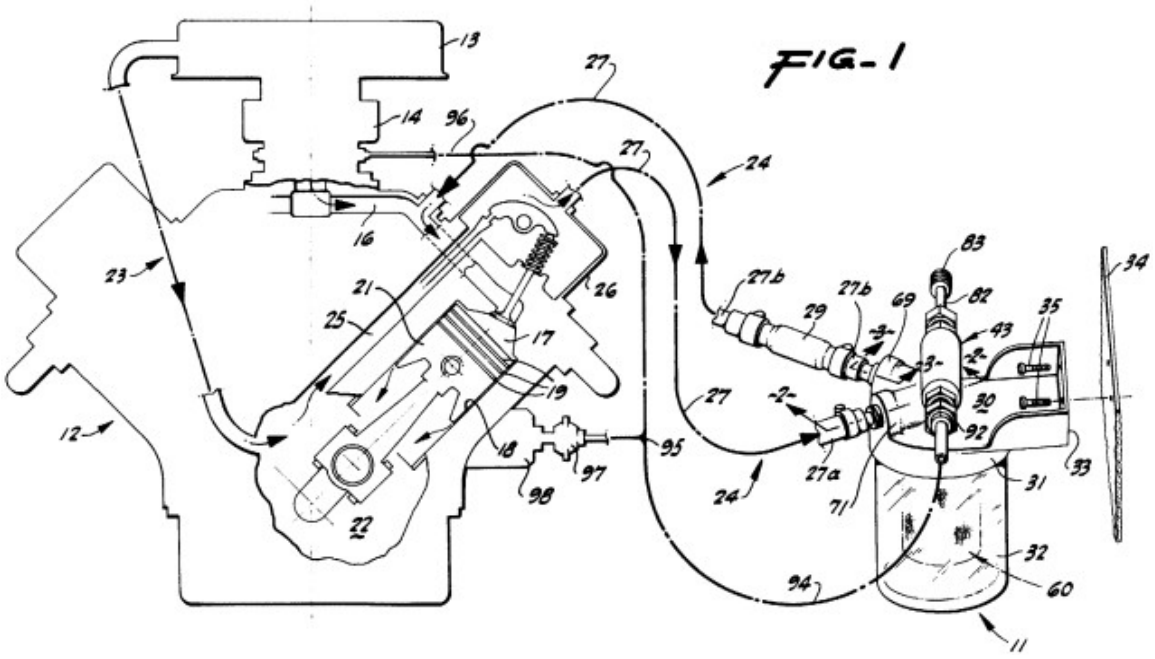
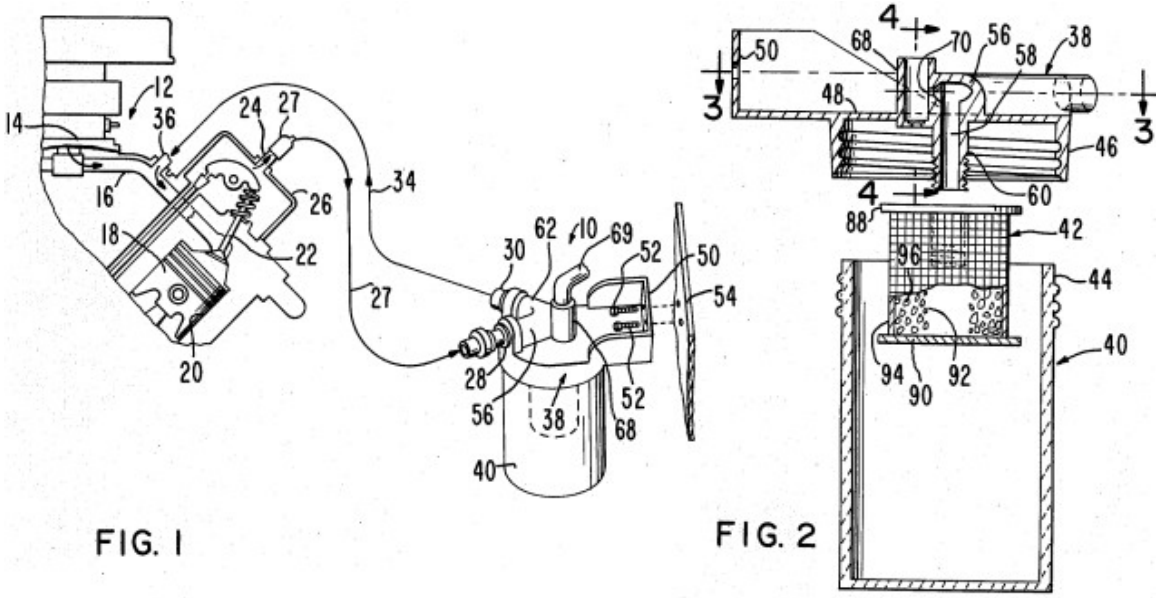
The drawing below is from the US Patent of 1978 (re-examined 1981):



And this drawing is from the US Patent of 1983:



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GST #15: SPARK PLUGS & KIKER PERFORMANCE PRODUCTS

KIKER WIRES

In brief: Kiker spark plug wires have less than 1 Ohms per wire. This means little or no resistance to impede the electrical - as well as magnetic field - created by the unique coil in the wires, that travel together to the spark plug. The wires have 3 to 5 sparks per wire. This burns more fuel in the cylinders, resulting in a cleaner, smoother and more powerful engine.

I just got off the phone talking to Pat Kiker, who is the co-inventor of the Kiker Wires and Kiker Battery Booster. She helped me make an informed decision on what Kiker product

Pat is a friendly woman who's always there to help so in case you want to contact her for assistance or questions, you can phone Pat at (863)453-4942 or email her at PatKiker@yahoo.com.

The products are also presented on their website http://www.KikerPerformance.com But first let me try to explain from my own understanding.

The deal with Kiker Wires is this: a VERY unique, patented invention to boost performance! Good for racing (Pat's first question to me was if I was racing cars), yet it's simply great for diesels and gasoline vehicles alike. Additionally – listen to this – these wires will do performance miracles AND gas economy miracles to all types of engines:

- Boats
- RVs
- Lawn mowers
- Trucks
- Go-Carts
- All-Terrain Vehicles (ATVs)
- Dirt Bikes
- Generators
- Small engines, Etc.

Anything and anybody that could use a better spark for better combustion. In other words all of us. I have studied the theory behind Kiker's strange-looking products. To many mechanics they seem hard to believe, simply because these people do not understand magnetism – and its relation to electronics and mechanics. I come from 30 years of high-tech, the majority of which in the field of Radar and its avionic and marine applications. To make life easier for you and save you the big words, the

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theory behind the Kiker products is very sound. It even seems obvious to a Radar addict like myself, kind of "why didn't I think of it before".
Let's start with this assumption that you may readily agree with: your current vehicle's design leaves too much to be desired. Watergas technology is only one of the things the engineers could have used but did not. Magnetism is another. Now magnetism, by itself a words that sounds like witchcraft, is nothing of the sort. It is a valid technology used widely in aerospace and military application since the early 1940's. Tesla started it many years prior, and Arthur C. Clark pushed it into wider use in Radars and related technology.

Magnetism is a force you use everyday. Your fridge magnets are one example. Electro-magnetism is yet another everyday thing. The ceiling fan cooling my room right now has a motor based on electro-magnetism. There are many devices using this principle. Every time you take a copper wire or any other electricity-conducting wire, and COIL it around something or around itself, it produces a strong magnetic field. Electro-magnetic, I should say.

Even the regular electrical wires running in the walls around you, simple and uncoiled, create magnetic fields every time you flip the switch. What happens is that the magnetic field of a coil or a wire, similar to a permanent magnet (your fridge magnet), is moving through the air and along the wire. But there is ALSO an electrical energy moving along. We'll not go into the complicated mathematics of it all, but just realize that the magnetic "field" (energy) and the electrical energy move at different speeds along the wire.

Now that's exactly what Harvey and Pat Kiker, a married couple, have used in their inventions. They too a long high quality copper wire and COILED it by hand. To keep the shape from changing they use cable ties. Other than using an expensive specialty copper wire, that's the simplicity - and ingenuity – of their inventions.

I'm saying inventions in plural because now it branches to two major inventions that yield two different products, namely the Kiker Plug Wires and the Kiker Battery Booster. Both based on the copper coil configuration. Both geared at higher performance. Yet they are different and you should be able to select the one you need in the next paragraph.

KIKER WIRES VS. KIKER BATTERY BOOSTER

According to Pat Kiker, if you have a distributor and a coil such as we used to all have before computers, then you should use the wires. One wire per spark plug.

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As I said the magnetic energy from the coil travels at a different velocity from the electrical energy, like the electrical energy you have in your regular spark wire - but is ALSO existent in this wire. This arrangement creates three separate energies:

1. The electrical VOLTAGE (how much force)
2. The electrical current (how many particles flow per second)
3. the magnetic field.

These 3 energies create a series of 3 sparks in each firing cycle of the engine. This enhanced spark generates a much stronger and better initial firing of the gasoline mixture, thus generating a much fuller combustion and more efficient burning and usage of fuel energy.

The Kiker Wires have been proven to work on all vehicles so far, that have a distributor. The gain in mileage is about 2-5 mpg, with some vehicles showing larger mileage gains. Depending on the vehicle you may have to send Pat a set of your old cables to get the right lengths for your engine and sometimes to use the cap (for instance if it is one of those long plug caps that reach deep into the engine block).

BATTERY BOOSTER

Now what do you do if you do NOT have a distributor, but instead your engine has coil packs fired individually by computer timing? The Kikers have thought of that too, and came up with a new product called BATTERY BOOSTER.

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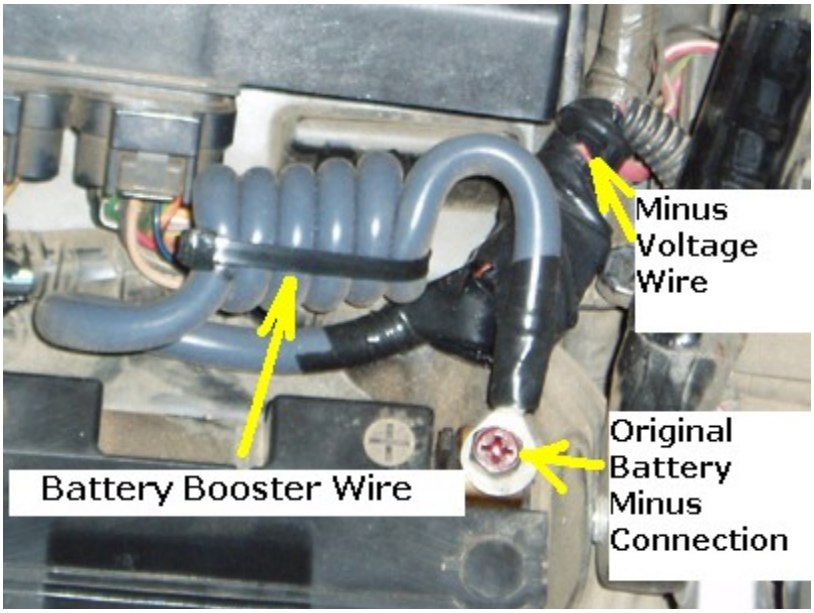

(The photo looks odd because it's from a motorcycle installation)

The Battery Booster creates a similar magnetic effect even though it's not connected directly to the spark plugs. The magnetic field still reaches the sparks and creates the same effect. Surprisingly, this field does not create a by-product of static or interference. After you have installed this product, turn on the radio while the engine is running. If you had static before, there's a good chance it will be quiet now.

All the above is my own humble opinion about how this product works. You cannot see the magnetic field with your eyes. You can only test its actual effect on performance.

The benefits of either the wire or booster are similar to introducing Brown's Gas into an internal combustion engine, namely:

- Better fuel economy (may take up to 7000 miles to reach optimal MPG)
- Increased torque
- Increased horsepower (you will this immediately)
- Helps reduce engine vibration
- Helps reduce emissions.

Needles to say, I ordered my Battery Booster immediately (in my humble opinion their current prices are too low for this high quality, rare deal). You can order by phone, or visit the website www.KikerPerformance.com and pay by PayPal. I'd recommend that you use the phone, to make sure you get the correct model – as you can see on the website there is a variety of models and sizes of Battery Boosters to fit different vehicles. Mine came with all the installation hardware called for by the simple instructions page (not shown), as you can see in the photograph below:

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SPARK PLUGS

Now that we've talked about spark plug wires, does it matter what spark plugs we use with those wires? It seems like it matters a lot!

I know a successful man that just invested more than $400 in a new set of very expensive "plasma action" spark plugs. I wanted to tell you about those, but let me say this straight up: this is not a book about boosting performance with high-end products. We're trying to save money, not waste it on expensive toys. So let me tell you about EXCELLENT solutions that will cost you very little.

According to the AAA Auto Club, old or dirty spark plugs might reduce your fuel economy by as much as 30%. Changing spark plugs in accordance with a vehicle's owner manual (no longer than 50,000 miles) will improve performance AND save gas.

The Kiker wires have to be handled gently when replacing plugs. But if handles in a gentle manner, will survive for the entire life span of the vehicle itself. So we don't have to replace the wires (or Battery Booster), only the plugs.

Lou LaPointe from Bright Enterprises says that "copper core" spark plugs are a waste of money, while Pat Kiker recommends them warmly – especially **Champion Copper Core**. She insists that copper core works great for them. At least both agree on **NGK V-Power** plugs.

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Champion Copper Core vs. NGK V-Power

A quick research around town taught me that not all auto parts stores are the same. Definitely not when it comes to spark plugs. AutoZone does not carry the above products at all. Not in my town anyway. NAPA Auto Store (they come in different names, search www.napaonline.com for a store near you) has both the Champion and the NGK, only $1.99 each.

Yes, I know some plugs sell for half of that, but compare this to the high end $12-$25 plugs that rarely pay for themselves, and it's certainly worth it at $1.99.

Both Pat Kiker and Lou LaPointe passionately recommend to **AVOID iridium and platinum plugs**, no matter what your mechanic recommends. He might not realize that you're now in the upper league of the MPG game...with different needs.

Yes, and another thing – before installation reduce the spark gap to 0.03”, or 0.75 millimeter. This will definitely maximize the performance of whichever plug you have chosen. Again, do this even if the car's book or plug pamphlet say otherwise.

Let's recoup: the use of Kiker products enhances the spark and creates a series of three separate sparks where there was one before. Now all you need is one the the spark plugs above, reduce its gap and you're set for best mileage **as far as spark goes.**

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GST #16: MOTOR OIL DOES MATTER

WHY DOES IT MATTER?

Good oils are essential to good mileage – there seems to be broad agreement on that. But when it comes to WHICH oil to use, we see that this is where agreement ends.

SYNTHETICS VS. "REGULAR" MOTOR OIL

Mechanics will swear by synthetic oils. Many vehicle manufacturers specify synthetic motor oils, for example (specific models of) Volkswagen, Honda and Porsche, to mention a few. It has become a "well known truth" that synthetics are superior in lubricity to natural oils.

Yet Lou LaPointe from Bright Enterprises insists that "synthetic oils do not adhere well to metals and thus are poor in critical hydrodynamic lubrication ability that keeps surfaces apart". LaPointe recommends using good petroleum oil especially **Torco** and its "**MPZ**" technology. MPZ is an anti-wear, anti-friction lubricant with natural attraction to metal. It adheres to pre-lubricated engine parts during storage. It is soluble in synthetic or petroleum oils, thus making an excellent ADDITIVE to existing good engine oils.

Of particular interest to us is "MPZ Magnetic Friction Reducer", a motor oil additive that protects at start-up and increases mileage, horsepower and engine life. In non-racing engines MPZ increases fuel efficiency as much as 6.3% during city driving and 8.5% during highway driving. Can be added to any brand of synthetic, synthetic petroleum blends and petroleum based motor oils. Its uses and benefits:

- New and rebuilt engine break-in
- Increases horsepower and torque up to 3%
- Increases fuel efficiency 6.3% to 8.5%
- Extends life of racing engine valve springs
- Improves wear protection of engine parts
- Won't wash off, rub off or burn off.

A complete series of oil quality tests was conducted by **Bret Boster** of Puyallup, Washington on a series of popular oils including Torco, AMSoil, Castrol, Mobil and others. The tests were performed by Sam Blumenstein of COME Racing Engines, on their in-house dyno. The tests, being run by an AMSoil representative, might have been biased. Yet you can study the methods and results in the document Oil Against Oils" www.performanceoilnews.com/oils_against_oils.shtml and decide for yourself if this was a battle of "oil philosophies" - or an actual battle for blood between the oils themselves rather than the experts. The overall rating according to Boster:

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1. AMSOIL
2. BP Visco 5000
3. Mobil 1
4. Mobil 1 (different price)
5. Hi-Tec HTO
6. Shell Helix Ultra
7. Royal Purple
8. Castrol R
9. Castrol SLX
10. Torco

WHICH PRODUCT SHOULD I USE?

I won't go in length here about specific product selection. You'd better go to the experts and consult them about your specific vehicle and weather conditions:

- **Torco** Racing Oils - www.torcoracingoils.com/product.html - Phone (562) 906-2120 or email tech@torcousa.com

- **AMSOIL** Synthetic Oil - www.go-synthetic.com (an independent representative) – or go straight up to AMSoil's Corporate website www.amsoil.com/products/motoroils/index.aspx

  To get the most recommended oil for my car, the OW-30, Series 2002, I signed up as a preferred customer and the oil was mailed to me. It arrived with a small leak, so they sent me a free bottle right away. Very friendly people.

RECOMMENDED OIL FILTER?

In the long run it is important to keep the engine and its oil clean of all particles that might deteriorate its performance. Lower engine conditions leads to loss of power and poor performance including gas economy. Filter quality, be itself, may add a good 5% to your fuel economy.

Extensive testing (I got a first hand testimonial from a client who's been using AMSoil for 15 years, and started using it myself) has shown that AMSoil filters outperform all regular filters. AMSoil "Ea" Oil Filters (EaO), for example, achieve a near-perfect absolute efficiency rating. The exclusive new technology used in EaO Filters provides filtering efficiency to **98.7 percent at 15 microns**.

These Filters have a far greater capacity than competing filter lines. When used in conjunction with AMSoil synthetic motor oils in normal service, EaO Filters are guaranteed to remain effective for **25,000 miles** or **one year**, whichever comes first.

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For filter selection visit www.smartsynthetics.com/oil-filters/selection-guide.htm

Lou LaPointe from Bright Enterprises reports best long-term experience with Donaldson and Baldwin Filters. The Donaldson filters, says LaPointe, remove contamination from gasoline and catch extremely tiny wear particles. The proof I see to the superiority of Donaldson is that AMSoil sell Donaldson's filters for heavy duty applications, rather than their own brand!

- Donaldson - LaPointe says they re available from any hydraulic company. I have not been able to verify this claim yet. Use their online product selection www.donaldson.com/en/engine/index.html or phone their support hotline: USA 1-800-792-8135, international 001-240-864-0225.

- Baldwin filters - select at http://www.baldwinfilter.com/products/start.html or phone their technical support hotline 800-822-5394 or 308-237-9706, or email hotline@baldwinfilter.com

LaPointe recommends to ask for a BIGGER filter that fits your engine, so you can catch more junk over the lifespan of the filter. He also recommends "add little magnets to filters to catch even sub-micron particles because iron and steel particles are always **meshed with copper, zinc, brass and aluminum particles** that are also captured." I'm not sure how he attaches the magnets, but you're welcome to ask him at phone number (612)345-5085, or email brightgreen@earthlink.net

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GST #16A: BY-PASS FILTER

WHAT DOES IT DO AND WHY DO I NEED ONE

Imagine you could give your engine a fresh oil change every hour...of every day...for years and years...would that help the engine to live longer?

A by-pass oil filter is an ADDITIONAL oil filter. It does not replace your current oil filter, only adds extra filtration to it. Your current oil filter has to handle the entire oil flow rate of the engine, and at the high rate flow of approximately 2.5 Gallons a minute, it cannot do a good job. Only the larger particles are caught – and the finer stuff goes right through! A typical by-pass filter cleans all the oil in the system several times an hour, so the engine continuously receives clean oil.

The by-pass filter is designed to remove the **finer** contaminant particles such as dirt and metals, and does it more thoroughly than the regular filter. It usually consists of an outer casing and mounting bracket, a dense inner filter and a flow rate regulator.

Let's start with the main reason for a by-pass oil filter: IF YOU FILTER THE FINE PARTICLES – YOU'LL NEVER HAVE TO CHANGE OIL AGAIN. That's right, the oil you're using never wears out, it just gets dirty. **Continual cleaning** kills three birds with one shot:

1. **Save cash** by recycling oil (no disposal costs) and using very cheap filters **saves recycling costs**, which adds up to $1000's in a small fleet.
2. **Save the environment** from contaminated oil (used oil is one of the largest hazardous waste streams in California).
3. At the same time, you'll be **saving on maintenance** too as well as getting more years of service per vehicle, due to better filtration.

It may even save some gasoline since the extended amount and flow of oil cools down the oil, resulting in increased efficiency.

More info on paper filters:

- www.utterpower.com/oil.htm
- www.gulfcoastfilters.com/
- www.kleenoilusa.com/

The reasons I've added it here is (1) it's a great $$$ saver in the long run, and (2) it's affordable. Especially if you're going to use **toilet paper**. That's not a typo, read on.

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TOILET PAPER FILTER!

There are various types of by-pass filters but I want to tell you specifically about the TOILET PAPER FILTER due to its extensive cash savings in terms of not spending on oil and filters.

The "toilet paper filter" has many enthusiastic users around the world that would swear by it. You install a special housing (which most likely not something you can build at home but is a one-time expense), then you simply stick a large roll of two-ply toilet paper in the holder. The oil is fine-filtered by the toilet paper, and when it's dirty, you remove it and insert another roll.

Paper towel rolls may be used for the larger housing (diesels and larger engines).

You can find some cheap housing on eBay, yet the best source I have found for both USEFUL INFORMATION and BY-PASS FILTER HOUSING is Ralph Wood at www.ByPassFilter.com

Ralph P. Wood
VinWood Enterprises
6790 Bobwhite Way
Sanger, TX 76266
1-866-263-2929
ralph@bypassfilter.com

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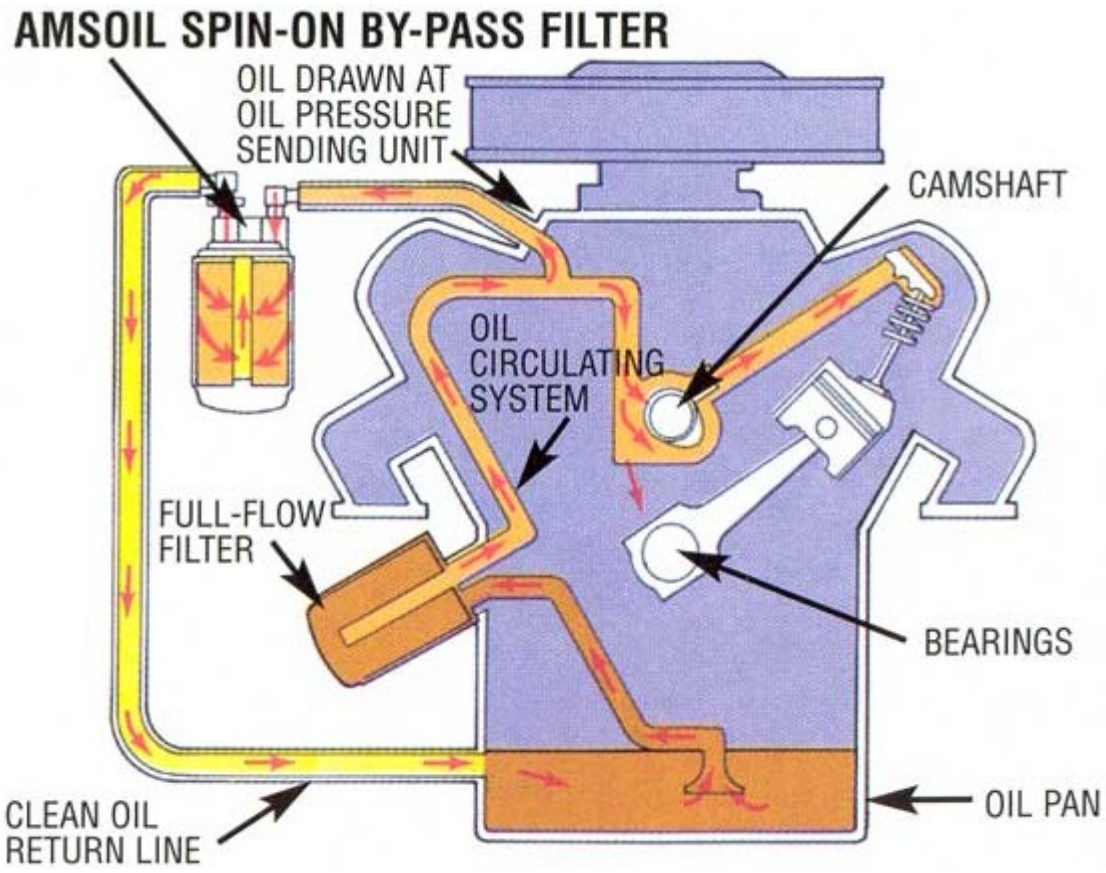
CONVENTIONAL BY-PASS FILTER

An alternative, non toilet paper filter, is AMSoil. They may not be the cheapest, but if you want quality you definitely want AMSoil.



To select the right by-pass filter for your vehicle, visit
http://www.amsoil.com/bypassfilters/applicationguide.aspx

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GST #17: TIRES

TIRE SIZE MATTERS

Size matters! No kidding... By replacing your tires with LARGER DIAMETER TIRES, you will need less RPM per any given speed. What happens in lower RPM is that there are less piston cycles per second – thus less friction and heat. Larger tires also add traction (road grip) and reduce noise. This can improve gas economy significantly (5%-10%) and the cost of larger tires is close to nothing if you need to replace them anyway.

It is not recommended though to exceed factory-recommended maximal size by more than 3%, because this puts additional strain on the transmission and power distribution mechanisms.

www.DiscountTireDirect.com offers good brand tires such as Pirelli and GoodYear for good prices and even gives **free UPS shipping** in the USA. I calculated that a new set of GoodYear tires, even though my Toyota doesn't need new tires yet, would pay for themselves in...2 years. Yet if I did need tires, larger tires would pay for themselves in less than two months.

TIRE PRESSURE

The basic assumption here is that the higher the tire pressure, the less friction between the tires and the road, resulting in better gas economy. That is true but not for ANY case. At a certain point higher pressure becomes a hazard.

There is a long time debate on the ideal tire pressure. Some say it is ok to exceed the maximal pressure recommended by the automaker by up to 15%. Others say that this might cause loss of road grip, especially in sharp curves and in emergencies such as a sudden brake.

One thing for sure: **lower pressure than recommended** is a waste of gasoline. SO first of all let's agree that it would be beneficial NOT to drive with too-low of tire pressure. So check your tire pressure regularly. And don't use a cheap pressure gage. Those $2 gages may be so much off that they will lose you more money than you saved when you bought them. Get a good **dial** gage for about $10-$15 (see photo). I've seen dial gages that cost only $3.60 – those are again a waste of your money. Even better than dial, digital tire gauges are considered to be very accurate and some are inexpensive, such as the **Accutire MS-4650 Key Chain Digital Tire Gauge** shown here, which can be obtained for as little as $5.51 on Amazon.com

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So let's summarize this GST: higher pressure is good to a point. To know where the limits are do the following:

1. Read the maximum pressure rating MARKED ON the TIRE – never exceed that.
2. Each time you try a higher tire pressure, test the new road grip by driving around. Do this away from children and heavy traffic.
3. If you feel that the road behavior of the vehicle has deteriorated, inflate the tires a bit and test again.

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GST #18: DRIVING HABITS

WHAT ARE "DRIVING HABITS"?

By Driving Habits we don't mean only how your hands are placed on the wheel or avoiding alcohol. It is a much wider subject, in fact very wide in scope. As a driver you have to look out for obstacles on the road as well as mechanical and electrical hazards.

For instance if your selection of tires, if wrong by a lot (i.e, crosses the safety margins built into your vehicle by its makers) may result in loss of traction at a critical moment. It's up to you, the driver, to judge each change and condition in relation to your driving skills and physical condition at any given moment. If you are a fleet manager, it is your responsibility to see to it that every driver in your fleet is educated and trained on proper consideration of his or her own "driving habits" at any given moment.

Since we cannot cover everything here, let's concentrate on what we as drivers can install and do for better mileage. But let me tell you that this is a MAJOR GST – your driving style all by itself (your behavior behind the wheel) can increase gas economy by as much as 30%!

INSTALL AND USE A MPG GAUGE

You're already familiar with the SCANGAUGE-II and its alternative(s) from an earlier chapter. I placed the reference and recommendation for those closer to the beginning of this book because they are vital to easy MPG testing. Actually the only way to read gas economy in real time.

Now that we're talking about how to drive, you will immediately see how this can help you achieve better economy.

WHAT'S MY OPTIMAL SPEED?

One of the most interesting things I was able to detect using my ScanGauge, was that my car was wasting gas in low speeds. Maybe it wasn't consuming more gallons per minute, but it was definitely "burning" the minutes away! Imagine yourself standing in red light and the engine is idling – whatever the fuel consumption, your vehicle is wasting gas for nothing.

Which reminds me by the way – **save fuel by turning the engine off if you're going to be idling for longer than a few seconds**. Such as red traffic light. This is ONLY ok for vehicles that do not require a long struggle to restart. Such long restarts waste a lot of fuel and stink up the car.

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Anyway I found out that my car has the best economy at around 55-65 MPH, not a bit slower!!! At least that's true for the mild weather and mild hills of Los Angeles.

DRIVE GENTLY

How much you depress the gas pedal matters – a lot. A whole lot. For example, says the **National Climate Change Committee**, "you can achieve higher fuel efficiency by taking your foot off the accelerator when approaching traffic lights and coasting towards it to avoid last minute braking when the light turns red."

On **gentle starting** they say: "Start car and immediately, but gently, drive away. Don't leave car idling. Today's engines don't need to be warmed up. Prolonged idling creates excess emissions and wastes fuel at the same time. Start slowly, avoiding rapid acceleration. Jackrabbit starts are fuel wasters."

Now you may be asking yourself now: "Ok, but how gentle is gentle?" Good question! Here is where the ScanGauge-II (or similar scanner) can help tremendously.

When I first discovered how to save a lot of gasoline on a computerized car, it was with the Bronco-II. I wrapped up its single oxygen sensor and went for my regular road test. It yielded almost nothing, maybe 3% gain, it was late at night and I was disappointed and almost gave up. At least for that night. Then I thought: "maybe I was running too fast...maybe I was riding too sportive for a real ECONOMY test?"

I was right...half an hour later of GENTLE driving on the same road and the same traffic load, my gas economy jumped 56%. I couldn't believe my eyes! Yet those were the numbers.

That night I learned an important lesson about driving habits – I have to drive gently or waste, knowingly.

At the time I had no ScanGauge – and the 1987 antique would not take a ScanGauge anyway. So I was always shooting in the dark in regards to gas-economy-oriented driving.

Today with the ScanGauge-II, it is a blessing. I can pinpoint every little nuance in my "driving habits", namely:

- Speed
- Road selection
- Gas pedal depression
- Gear
- and of course...gas station selection!

The effect of the computerized readout of MPG is tremendous because:

1. Direct feedback in real time is the only way to stop guessing and starting KNOWING what's going on with your fuel economy.

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2. After a while the NEW driving habits sink in, so you can use them independently of reading the MPG.

3. You'll be able to detect if under the hood conditions are out of balance or out of optimal - by glancing at your gauge. For instance a drop in MPG can tell you that either your car needs servicing, your Water4Gas system needs servicing, or maybe it's just a bad gas station that you should never visit again.

COASTING DOWNHILL EQUALS HUGE SAVINGS

Many will tell you not to drive in neutral. In some geographical regions of this galaxy it may be illegal. Yet it may have, with correct use, a tremendous effect on your gas economy.

So again, let's ignore for a moment the rules of the road and assume you're cruising on a non-public road in South Bulgravia, it's late at night - or early Sunday morning - and the road is all yours...nothing that will prevent you from changing gears as they fit YOU. Now here's what you can do:

1. Theoretically speaking, 50% of all road sections are downhill. However not all of them are useful for this GST, especially if they are very short. when you are about to go downhill for what seems to be a long stretch, prepare yourself by accelerating to a good speed just before the hill starts to curve down. Higher speed will give you better economy downhill.

2. As soon as you start going downhill, shift to neutral. You will learn after a few times when is the best moment to shift gears.

3. Totally release your foot off the gas pedal.

4. Glance at your ScanGauge and watch your MPG go up-up-up. It will take several seconds to reach maximal MPG, and will stay there or near. In long stretches downhill, and especially if you've gained enough speed before going into neutral, you will see amazing numbers. Mine went up to 340 Miles Per Gallon! Here's how it looked like (I was too excited to catch the 340 MPG, but these are close enough):

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[REMARK ON THE PHOTO: Notice the display reads "0.2 GPH" just above the MPG readout? This means 0.2 Gallons Per Hour are being consumed. That's very, very low, even for idling at standstill, not to mention for high speed motion.]

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5. NEVER ATTEMPT TO TURN OFF THE ENGINE WHILE DRIVING. IN EMERGENCY IT MAY BE OK, BUT DEFINITELY NOT IN AN ATTEMPT TO SAVE FUEL!!! I'm not talking about specialized race cars, I'm talking about a regular vehicle on the road.

6. If you continually do this on a hilly road, you can almost double your mileage.

BRAKING

This idea relates closely to the previous one. It is offered by Shane Christopherson of Arizona. I believe that if you have a daily commute that you know well, and after some trial and error, you can gain 5%-15% in addition to the downhill method.

Shane says he believes this is the greatest gasoline saver, and suggests to coast in neutral before braking. Some vehicles may do better leaving the vehicle in gear and coasting while others will do better in neutral. According to his calculation he can coast at least 1/3-2/3 of a mile for each stop he makes, accumulating to 3-6 miles out of his normal 37 mile commute.

Since modern engines shut off most or all of the gasoline while costing, the overall mileage gain can be very significant if you learn to do it right. For better understanding of this method, read the second titled "Braking" at
http://c4caraudio.com/mpgs/3steps.htm

SOMEWHAT RADICAL IDEA

SEVERE CAUTION: DO NOT CONFUSE THIS IDEA WITH TURNING THE ENGINE OFF USING THE IGNITION KEY!!! BY WHICH YOU MIGHT LOSE BRAKES OR EVEN STEERING!!! Also I don't know about legalities – it's only an idea... Radical, I said.

Earlier today I was reading about gas-electric hybrids, how they shut off the ICE (gasoline) engine every time the car stops. And I thought: "why not do that for any car?"

Well, that's a bit radical, but here's the idea. It may appeal to you, or not. The idea is to rewire the starter key to a separate switch. This switch will shut off the engine and restart it whenever you're ready. IT MUST BE INSTALLED IN A VERY CONVENIENT PLACE for this to have any applicability. This could be on the dashboard if you have easy access to it, on the steering wheel or on top of the gear shift handle.

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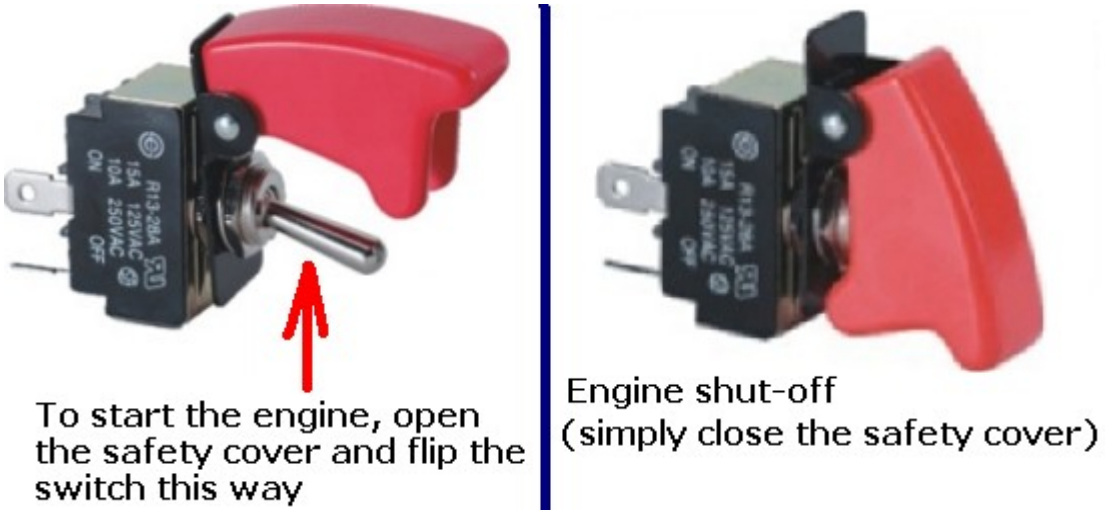

The switch must be type DPDT which means it has two separate switching circuit, one for starting and one for shutting off. I cannot design a circuit since there are many possible configurations. But I know it's possible. All my motorcycles had a separate "kill engine" switch or push-button. And I also know that any slightly-above-average auto electrician can figure it out and adapt this idea to your specific vehicle.

One last point, again, is accessibility and ease of use. Human engineering is very important here. Because if it won't be comfortable to reach and easy to flip, you would soon stop using it.

Switches of this type can be obtained from auto parts stores, as well as industrial automation stores. JUST MAKE SURE THEY ARE "DPDT" (double) otherwise you'll need a very complicated circuit, additional relay(s), etc.

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AUTOMATIC IDLE SHUT-OFF

Seemingly, I found out, the above idea is not so radical after all. Two automakers have implemented an automatic circuit that does that in...two models (Honda Insight and Volkswagen Lupo)...out of thousands of models available! Shows you how dedicated they are to saving your gasoline **even when they absolutely have the technology, right now, fully developed and debugged.**

Idle Shut Off is an electronic device that shuts off the engine once the car has been idling for 2 seconds. Once you hit the gas pedal, it starts the car back up.

A prototype was developed by Zemco Corporation of San Ramon, California, and achieved gas savings of 7.5% in a typical stop-go test drive. The brain of this system sits in the dashboard and collects signals from the brakes, engine coil, and ignition switch, as well as its internal timers and two sensors (one on the gas pedal and a coil that detects car motion).

For manual gear transmission cars stopping on a steep hill, the program is being modified to restart the engine when the foot is lifted off the brake pedal. Quick restarts of warm engines is much less harmful (to the starter) than long cranking of cold engines.

The device had marketing problems because the gov't did not allow them to bypass the transmission safety lock (prevents starting of newer cars when in gear). I believe the product has eventually disappeared, but who says you cannot build one yourself? If you know the simplest basics of robotics or machine automation, you can build one in one or two weekends (send me photos!)

FURTHER READING

If you like to play with driving styles and methods, here is some interesting "unconventional wisdom" from Jim Chiodo: www.avoidgaspain.com/wordpress/

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GST #19: COMPUTER REPLACEMENT & RE-PROGRAMMING

Note: Water4Gas technology does not require you to mess with the computer. That's the whole beauty of it – sheer simplicity, basic tools and basic skills. This chapter is for the advanced experimenter and for students of automotive technology.

HACKING THE COMPUTER

Ever since computers came along into the design of modern cars, 90 of car performance boosting went away from the hands of grease monkeys with their mechanical boosters and pipes – into the hands of geeks with their computerized gizmos. New York times published a series of interesting articles over the years, that will give you a good introduction to the world of ECU hacking:

- query.nytimes.com/gst/fullpage.html?sec=technology&res=9A0CEFD6103AF930A25751C0A9629C8B63
- www.beatking.com/forums/index.php?showtopic=1928&mode=linear
- www.nytimes.com/2006/10/25/automobiles/autospecial/25hacking.html?ex=1185768000&en=a65a43522527b328&ei=5070

NEW COMPUTER VS. ECU CHIPS

There are two basic options: either replace the entire computer with a new one, or replace only the "chip". There are a very few reasons to replace a computer. Either it has been damaged for whatever reason, a new engine has been installed that requires a different computer, or – and that's the most interesting reason from a hackers point of view – if you want to have much more control and be able to program the computer yourself. Which can then be done via a PC or laptop.

OpenECU.org says that it is "a place to shed light on the once 'dark art' of logging, tuning, and reflashing [reprogramming] of modern engine computers (ECUs)." The OpenECU project was started in 2004 by **Colby Boles** with the goal of making engine computer (ECU) reflashing knowledge and tools freely available to anyone. The project consists of a web forum, wiki pages (members-contributed knowledge and articles), and open-source software from many contributors.

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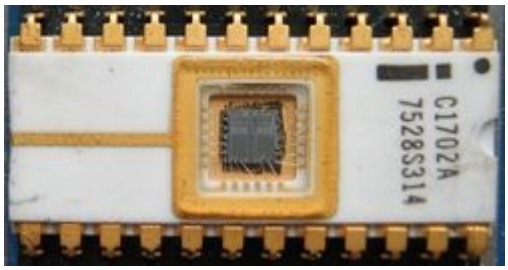
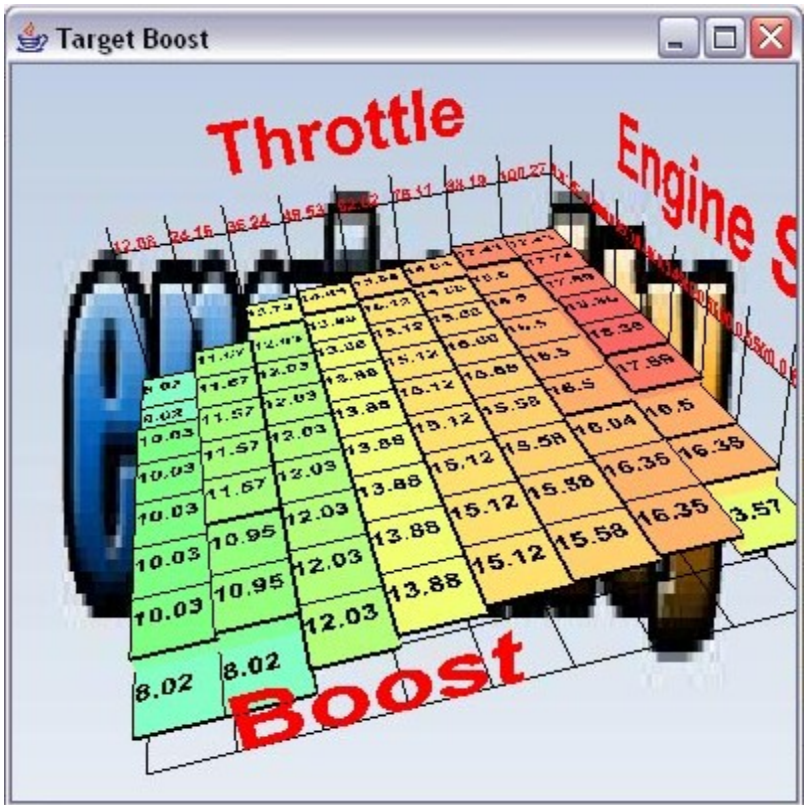
In most cases people who are simply interested in performance will not go as far – or as expensive – as replacing the entire computer. The second choice, then, is to replace "the chip."



What is a chip? It's a self-contained computer part that performs certain functions. There are many chips in each computer – so what do they mean by "THE chip"? Well, that's one major chip in your car's computer that, if and when replaced, will possibly change the behavior and performance of the car dramatically.



Screenshot from an open-source reprogramming software.

The best place to start searching for a chip is...eBay. Just visit www.eBay.com and search "ECU chip". You will find various chips offered for specific models, and it will also lead you to companies offering to come to you for reprogramming service, such as the UK based ECU-Evolution(www.ecu-evolution.co.uk). They serve South Wales area during the week and Northampton area during the weekend. Their services start at £250 and they offer partial refund (and will revert your ECU to its original setup) if you're not satisfied with the results.

Chips on eBay come as cheaply as $12.95, but with a couple hundred offers, naturally not all cars are covered. It's mostly Honda, BMW and Nissan on the US eBay, with some European cars such as Audi, VW and Peogeot (Diesel) on the UK eBay.

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PROGRAMMERS – DEVICES

There are **human** ECU programmers out there but I do not mention them here for reason. The reason is that if you do not already know one personally, they are very hard to find. There are companies that can be found on the Internet to re-program your vehicle's computer, but according to my evaluation their services are not only expensive, but are also very limited when it comes to FUEL ECONOMY. Some of them concentrate on power boosting - resulting in more pollution - and that once more is not our purpose.

The term "programmers" in this chapter refers to small (usually hand held) computers built for the purpose of reprogramming specific makes and models of vehicles. It is quite impossible to cover the entire scope of vehicles in the world in one little instrument. Not economically anyway.

These instruments come from a limited number of vendors who have exhaustively researched the subject of car computer programming, and have invented their own technology to reprogram specific vehicles. For instance Truck Stuff USA, offers unique solutions for reprogramming, ranging in price and options roughly between $260-$760.

Visit www.truckstuffusa.com/chipmodandpr.html for more details and to order.

Their most interesting offer is the Power Programmer III by Hypertech. It is only geared for Doge, Jeep, Ford and GM vehicles, but what makes it attractive is its unique ability to reprogram the computer for (1) best performance and (2) gas economy, with only two button! You plug it in and wait for the handheld programmer to read VIN and other data from your car's computer. Then it takes you through a series of yes/no questions, according to which it will reprogram your car to safely do whatever you want (to its physical limit, of course).

The price tag for the Power Programmer III varies by car model and ranges from $355 to $395. Each programmer is unique to a specific model and cannot be safely used for a different car.

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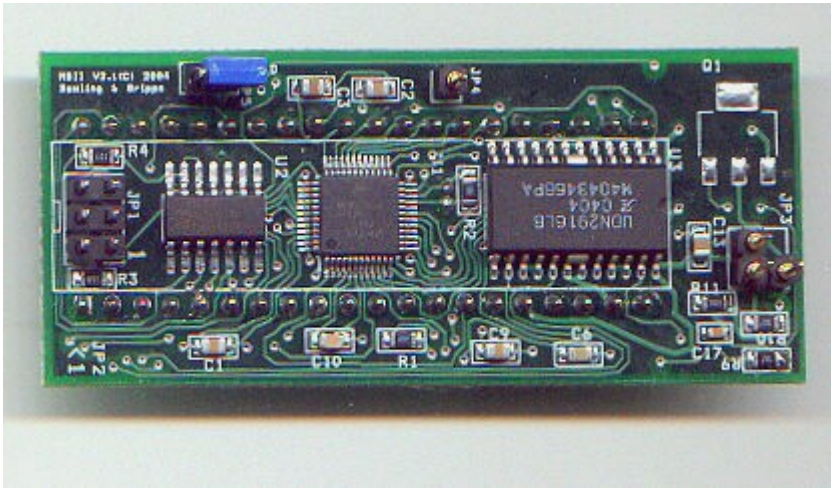
EDUCATIONAL PROJECT

MegaSquirt is intended as an educational project. If you like to tinker with systems, and want to learn about electronic fuel injection, this is a great experimental Do-It-Yourself project.

MegaSquirt is a programmable electronic fuel injection controller that you build yourself and can work on virtually any liquid fueled spark-ignition engine, naturally aspirated or boosted (up to 21psi boost with the standard MAP sensor).



Note that MegaSquirt is the controller only, you will have to gather the remaining fuel system parts yourself (1 to 16 injectors, sensors, fuel rails, fuel pump, etc.)

You will need the ability to build and test printed circuit boards, but extensive support is given on the website http://www.megasquirt.info which makes it as easy as it gets with modern electronics. I realize this is beyond the scope of the average MPG experimenter, and I've added it here for the interest of geeks and electronics students who may be walking among us (walk tall, guys, I'm one of you!)

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GST #20: CHANGE THE CAR?

OPTION1: TO REPLACE OR NOT TO REPLACE?

There are considerations on why to choose another vehicle for better economy. In this book I did not dive into this deep subject. My assumption is that you have already chosen your vehicle, or that your economic situation does not allow you the luxury of a new vehicle. Because if you had all the money in the world, why would you be reading this book, right?

However if you ever come to a decision point of replacing your vehicle, I'm guessing you would want a better mileage right off the bat, in other words you would like to have a better starting point. Good for you, my friend. For the education on vehicle choses I would leave you in th hands of the experts. And the experts are two fold – those that have a broad picture on vehicle choices in your country or city, and the second type are those who have a limited scope but have a first-hand experience with the certain type of vehicle you're interested in. Here is how to find these two types:

- Get general advice, such as these "Tips on Buying for Fuel Economy" from the National Climate Change Committee:
  www.nccc.gov.sg/fueleconomy/Buying.shtm

- Consumer reviews – search www.Google.com using your model of interest PLUS consumer reviews. For instance if you're interested in a Toyota Camry, type 'Toyota Camry consumer reviews' and read as many first-hand, real user testimonials, as you can. I can assure you that your decision making will be much easier after that.

  Make sure though, that the specific model they're talking about is available in your area. Sometimes the same brand name in different countries means a HUGE difference in fuel economy. Lou LaPointe tells a personal story demonstrating this point: "I spoke with a guy in Costa Rica, Central America. He was driving a Hummer diesel that gave 60+ MPG and was told the engine lasted practically forever. When he tried to buy one like it and send it to the States, he was told the car could not be sold or exported to the U.S. as it was strictly for Central or South America. The same vehicle in the U.S. delivers 9-12 MPG, I believe."

OPTION2: INSTALL SPOILERS

From the National Climate Change Committee I am borrowing the following vehicle-changing tip, the only one that seems to fit within the scope of this book.

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There are many components in the bottom of a vehicle that will obstruct the airflow and **increase drag force**. Spoilers in front of the wheels can encourage air to pass on either side of the vehicle and improve fuel economy.
We're not talking here about the wing-like spoilers. Those create downforce that reinforces road grip and improves handling at extremely high speeds. Let's leave those to race drivers. The recommendation here is to install those below-the-bumper spoilers that prevent air from flowing under the car.

Auto detailing stores may take spoilers into the level of science. For example Erebuni Corporation, a large detailing store on 158 Roebling Street, Brooklyn, New York, defines several different types of front spoilers:

- **FBO - Front Bumper Overlay:** It covers over the entire existing bumper cover or the bumper without removing either.
- **FBS - Front Bumper Spoiler:** Replaces the bumper cover or the complete bumper including the bumper reinforcement and absorbers.
- **FS - Front Spoiler:** Attaches below the front bumper or on the bumper without removing the original bumper or bumper cover.

If you ask me, any of the above is OK if it seems affordable for you, since all do basically the same service – reducing drag. I'm not sure how much the rear bumper spoiler enhances fuel economy. Depending on the car's shape and hight above ground, and also depending on your normal speed, it might not do any good or even function as a parachute that adds drag. I wouldn't use one on high riding vehicles, unless you install side skirts as well.

OPTION 3: AERODYNAMICS

It is also possible to save fuel using sportive-like spoilers. I mean they look "sportive", but they are not built for speed. They are rather calculated to improve the aerodynamics of the car.

When we speak of aerodynamics in cars, we are not trying to take off and fly. And if we are not trying to create downforce in order to drive very fast and still hold a grip on the road, what's left? Reducing air drag.

Ernie Rogers from Salt Lake City, Utah, built this "Beetle drag reducer" and traveled with his son all the way to Anchorage, Alaska. Nearly 3000 miles. They averaged 57 MPG. On a normal trip around Salt Lake City he does 65 MPG. His website www.best-mpg.com promotes the techniques he's been experimenting and using for fuel conservation and emissions reduction.

One very easy aerodynamic trick for trucks and pickups: when you're not loaded, open the tailgate to let the wind blow straight out of the bed. All the above, almost

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needless to say, will not work in slow city traffic. Since in slow velocities it does not matter if you have the aerodynamics of a chicken or an elephant :-)

GST #21: DEMAND YOUR TAX $$$!

WHY IS THIS HERE?

What's IRS got to do with gas economy? A lot!

First off, it has to do with your overall costs of driving a vehicle, and second, it has to do with vehicle related and fuel-related taxes that you HAVE ALREADY PAID – and you deserve some of it back. This GST, then, has everything to do with maximizing your transportation dollar to the last penny coming to you BY LAW.

NOTES ON "QUALIFIED VEHICLES"

In the download area there are IRS "green car" or "green fuel" forms. These are official IRS forms, ready to be printed and filled out. And as promised there is a document on maximizing your tax benefits. But let me explain a bit about the strategy of submitting these forms.

First let me give you the references and important links:
http://www.water4gas.com/members/articles/Notes_READ_THIS.txt
http://www.water4gas.com/members/articles/IRS_Chapter_12.pdf
http://www.irs.gov/pub/irs-pdf/f8910.pdf
http://www.dsireusa.org/Index.cfm?RE=1&EE=1
http://www.eere.energy.gov/states/state_information.cfm
http://go.ucsusa.org/hybridcenter/incentives.cfm

The documents above clearly demonstrate that the IRS will give you tax relief for clean-fuel burning vehicles, or hybrids that use clean fuel in part. On their website you will find a list of "qualified vehicles", all made by big automakers such Toyota, Honda and other famous hybrids. It may seem that if your model is NOT on the list, you're out of luck.

But that's NOT what the actual IRS Code (IRS Law) says! Again, I'm no lawyer, but I can read what's been written, and it states in very clear words as you can see from Chapter 12 of the Code, what's defined BY THE IRS CODE to be "Qualified property":

```
Your property must meet the following requirements to qualify
for the deduction.
1. It must be acquired for your own use and not for resale.
2. Its original use must begin with you.
3. Either—
      a. The motor vehicle of which it is a part must satisfy
      any federal or state emissions standards that apply to
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each fuel by which the vehicle is designed to be
propelled, or

b. It must satisfy any federal and state emissions
certification, testing, and warranty requirements that
apply.
```

WHO REALLY DESERVES THE REFUND?

Since THE HYDROGEN-OXYGEN PART of your water hybrid emits only water and oxygen as its "emissions", it qualifies for THAT part. As for the regular, original engine, I assume you have maintained it properly and have passed the regular smog tests of your state.

As for the water-based emissions, you don't have to invent the wheel, refer to well-documented scientific research as published on the Internet, US Patent Office and other scientific institutions. As far as I can predict the IRS may try to disqualify your submission and pooh-pooh the validity of its scientific background. The IRS is not the scientific arm of the government. It's the Patent Office and EPA as far as we're concerned. The Patent Office is in general agreement with water enhancers and other gas savers and emission reduction technologies, and has been so traditionally for a century. The EPA is against them and has not approved ANY add-on technology for saving gas and saving the environment. Not that we know of.

www.onboardfueling.com claims that their secret $4,000-$14,000 systems are EPA approved, but we have yet to see evidence. Popular Science has sweepingly pooh-poohed any and all such technologies just as well. These last two, the EPA and Popular Science, are obviously against home-made gas savers.

Yet they are not the law.

Insist that the IRS approves your submission. If you're not willing to fight, or are not sure of the validity of this technology, either assist yourself and arm yourself with before/after smog tests, or don't fight at all. You are using this IRS information, as the rest of the information we provide, totally at your own risk.

But remember this: the more such submissions the IRS receives, the less they are likely to want to waste money and time fighting it. At a level of only 2% of the population, I predict it will be accepted as "normal" and everybody will start doing it. This 2% penetration level has been proven to be the only qualification for a new trend to "catch the wave" and boom real fast. It has happened at the start of cellphones, DVDs and many other technologies and trends. Two percent of the population is all it takes.

And I say: Let's START the ball rolling! A snowball is unstoppable, but somebody got to start it sometime, somewhere. I give you my word here that, for 2007, I'm going to put my balls on the fireline and submit IRS Form 8910 with my taxes, for my home-made WATER HYBRID.

Here, I started the snowball rolling! You with me?

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GST #22: GET HELP

FUTURE - VISION

Sometime in the future all this will be history and cars will be automatically tuned to run on water. For now, standards have not been established yet. Therefore getting great results from the exciting technology of Hydrogen-On-Demand are all about experimenting with your own car, truck or boat and finding out what works best for you.

PRESENT TIME – SURVIVAL AND MUTUAL HELP

We're here for a reason – to combine the knowledge of many experimenters like yourself, scientists and field developers – and give you a continual stream of fresh knowledge in this exciting field of free energy.

So go ahead and USE US, or more correctly USE THE POWER OF THE CLUB:

- Email or mail your questions.
- Send us your successful actions and results – for the benefit of all experimenters. I want you to know that you are enjoying the fruits of the work of MANY experimenters who did not hesitate to share their work, and I thank you in advance for doing so.
- Promote yourself and your business: Write success stories that will be published on our website (feel free to put any commercial data about your business – we will NOT remove such advertising unless we think it's objectionable stuff).
- Also stay tuned for our newsletter which is jam packed with useful news and breakthroughs.

HOW TO CONTACT US

To get more help, feel free to email or phone via the website.
I'm not publishing the contact info here in case it changes.
Always visit the contact page for updated contact info.

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WHAT'S NEXT?

I hope reading this book has enhanced your belief that water-to-energy is not a hoax and is not complicated or expensive rocket science either. Your next step is to make full use of the knowledge you have, for your benefit and for the benefit of your environment.

If you are reading this book and you don't have a system to install in your car or fleet yet, visit the "Free Marketplace" and get an actual system – now you know how to use it.

YOUR PARTICIPATION AND SUPPORT ARE GREATLY APPRECIATED!!!

To a Free Earth!

Ozzie Freedom
www.**Water4Gas**.com

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WE NEED YOUR HELP

THANK YOU FOR READING THIS BOOK!

Please help us spread the good word – the world MUST know about this technology! So please...

Enjoy this exciting new technology - and tell your friends about your

Water4gas

HOW TO MAKE MONEY WITH THIS TECHNOLOGY WITHOUT EFFORT

Visit the link below to discover an easy to do program. All you do basically is tell people about it and we do the rest. We close the deal, take payments, do the shipping etc. We cut you frequent commissions checks. Visit the affiliate page (link at the bottom of the website) for exact terms and details, and fill out the short application.

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GLOSSARY

UNIT CONVERTER:

Miles to kilometers? Grams? Ounces? Would you like a SIMPLE conversion tool that does not need to be purchased or installed? Visit the simple converter **www.flowmeterdirectory.com/flowmeter_unit_converter/index.htm**

or the very extensive collection of converters at **www.unitconversion.org**

302/304: Grade of stainless steel. Strong and durable under water.

316L: Grade of stainless steel. A bit softer than the 302/304 grade, due to lower carbon contents, yet even more durable under water during electrolysis for the very same reason. We use 316L for our anode (see def.) to prevent fast oxidation by the electrolysis (see def.) process. Oxidation corrodes only the anode, since it is always surrounded by oxygen during electrolysis.

AC: Alternating current. Electrical energy (electrical current, voltage) which alternates cyclically between positive and negative in polarity.

Acetone: A highly flammable, colorless solvent. Also known as propanone, dimethyl ketone, and other names. It is readily soluble in water, ethanol, ether, etc., and itself serves as an important solvent (actually the strongest consumer-grade solvent available to us). Its most familiar household use is as the active ingredient in nail polish remover. Also used to make plastic, fibers, drugs and other chemicals. A MAJOR FUEL SAVING ADDITIVE AND IS THEREFORE THE MOST IMPORTANT COMPONENT OF OUR FUEL ADDITIVE COMBOS.

Ampere (amp): A measure for electrical flow. How many electrical particles flowing in a conductor (wire, resistor, etc) per unit of time.

AMSoil: A manufacturer of high quality motor oils, filters and additives.

Anode: The positive-charged pole (wire or plate) in an electrolyzer (see def.) or battery. The electrode with the positive voltage. In an electrolyzer, this is where the oxygen is being produced.

Atom: Once thought to be the smallest part of an element or substance. Today we know it's not so - it is made of "sub-atomic particles" such as electrons - that can probably be broken down further.

Atomize: Making liquid or substance into a mist.

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AXG7: Our abbreviation of Acetone-Xylene-GP-7 (GP-7 is a racing lubricant by Torco). Blended in correct ratios, it is a powerful fuel additive you can make yourself.

AXG7-TS: (AXG7-Teaspoon) A more economical version of AXG7, where only one teaspoon of the racing lubricant GP-7 is blended with acetone and xylene.

BB: Ball Bearing. Sometimes refers to ammunition of BB guns, but can also mean steel balls from a mechanical source such as a ball bearing device for shafts.

Bio fuel or Biofuel: Fuel (for transportation, in our case) made from "biomass" - biological sources such as corn or wood that have completed their life cycle; environment friendly. Biofuel could be liquid, gas or solid.

Blow by (gas): Gases that skip past the piston rings in an engine; normally routed back into the intake via the PCV valve.

Boric acid: Also called boracic acid, orthoboric acid or hydrogen orthoborate. It is a chemical compound, a mild acid often used as an antiseptic, insecticide, flame retardant, and a component of other chemical compounds. It exists in the form of colorless crystals or a white powder and dissolves in water.

Brown's Gas: A mixture of hydrogen and oxygen. The product of an Electrolyzer. Two parts hydrogen to one part oxygen plus some water moisture. Named after Prof. Yull Brown but goes by many other names: Rhode's Gas, after it earlier researcher, Dr. William A. Rhodes; also called HHO (Hydrogen-Hydrogen-Oxygen), hydroxy, oxy-hydrogen, green gas, di-hydroxy, watergas or water gas, waterfuel or water fuel, etc. In Korea they call it Brown Gas. Korea by the way has very good technology of HHO generators for industry. Brown's Gas is great not only for supplemental fuel for engines, but also good for cutting metal, soldering, brazing (joining metals at high temperatures), as well as the welding of various metals inexpensively (compared to the commonly used welding with acetylene).

BTU (British Thermal Unit): A unit commonly used to measure heat energy; the amount needed to raise the temperature of one pound of water by one degree Fahrenheit.

Bubbler: A safety-enhancing device (or part of a device) to bubble air through water in an electrolyzer.

CAN: Controller Area Network. From 2008 onward it is the mandatory vehicle control system that replaces OBD-II (On-Board Diagnostic, see def.) in all new vehicles. CAN is a general term - the specific system that will be used is titled 'ISO 15765-4'.

Carb: Carburetor.

Carbon Monoxide: A gas produced by incomplete combustion of organic materials. Highly poisonous; flammable gas - burns with a blue flame.

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Carbon: The element upon which all organic molecules are based. Carbon has an atomic weight of 12.00, and occurs elementally in these forms: diamond, graphite and amorphous carbon such as coal or carbon black.

Catalyst: A material used to induce or enhance the chemical reaction between other materials without being changed in the process.

Cathode: The negative-charged pole (wire, plate) in an electrolyzer or battery. The electrode with the negative voltage. In an electrolyzer, this is where the hydrogen is being produced.

Cell (or Electrolyzer cell): Defined as one unit in an electrolysis system (a series of individual cells). By a certain arrangement of electrodes (when plates are used), a single device can have several cells. In Water4Gas electrolyzers where electrodes are spiraled to save energy, each device (one jar) would constitute one cell.

Combo: Slang for 'Combination' or in other words a popular formula.

Conductor: An electrical conductor such as wire or metal plate, that allows an electric current to flow through it.

Conservation: Various techniques and methods to use less energy, either by utilizing more efficient technologies or by reducing wasteful ones (including wasteful habits).

Current: (in electricity) the movement of electrons through a conductor. Measured in Amperes. If for instance the conductor is copper, "electrons" are those particles of the copper atoms, which are leaving their place and moving along between other atoms in the copper.

D17: Refers to document D17.pdf written by Patrick Kelly titled "Dealing with the Vehicle Computer". Is available on the Internet (search Google for "Dealing with the Vehicle Computer" WITH the quote marks).

def: definition.

DC: Direct current. Electrical energy (electrical current, voltage) which does not alternate in polarity, in other words it keeps its positive and negative; and is also somewhat "stable", in other words it doesn't pulse. Even if it changes all the time, it could still be called DC if it has those characteristics.

DEMSE: Dual-Edge MAP Sensor Enhancer. A dual-knob device to adjust mixture.

Distilled water: Water that has been "purified" of its contaminants, acids and minerals such as salt. Rain water are not distilled water.

DOSE: Digital Oxygen Sensor Enhancer. The device described in D17 (see def.)

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DPDT: Double Pole, Double Throw. Switch type that can switch two circuits separately (that's the "double pole"), and is capable of making an electrical connection in each of its "throws" (sides of its motion).

ECU: Engine Control Unit. Your car's computer. It's the heart of the engine management system in a modern car, collecting many inputs from sensors around the car and controlling all functions of the engine such as fuel injection and heat management.

Efficiency: The ratio of total output power to input power expressed as a percentage. A numerical expression of the ratio between waste and actual work done. For example a low-efficiency car engine uses most of its input to produce heat, noise and vibration, rather than forward motion.

EFI: Electronic Fuel Injection. The modern science of wasting gasoline.

EFIE: Electronic Fuel Injection Enhancer, a device to correct the stoichiometric (see def.) level programmed into a car in order to accommodate waterfuel technology. Manufactured exclusively by Eagle Research (www.Eagle-Research.com)

Electrode: A conductor (such as metal wire or plate) which dips into an electrolyte and allows the current (electrons) to flow to and from the electrolyte.

Electrolysis: When a direct current is passed through a liquid which contains ions (an electrolyte), chemical changes occur at the two electrodes; usually a separation of oxygen from hydrogen or other substances it is chemically bonded with. In our case the process of splitting water into hydrogen and oxygen.

Electrolyte: A mixture of catalyst and water in an electrolyzer. We sometimes refer to the **catalyst** as **electrolyte**. That's a common mistake – the **catalyst** in our case would be the Sodium Bicarbonate ("baking soda") and the **electrolyte** would be the solution, or the mixture of Sodium Bicarbonate and water.

Electrolyzer cell: A single cell in an electrolyzer: an anode and a cathode immersed in an electrolyte. An electrolyzer can have one cell or many. Also see 'cell'.

Electrolyzer: A device or machine that splits water into hydrogen and oxygen thus producing Brown's Gas. A common misnomer is "hydrogen generator"; sometimes called "cell", as in 'Joe cell'.

Electron: Part of an atom - a negatively charged particle that can leave the atom or be added to it, thus changing its "electrical charge" to negative or positive.

Emissions: Let's not go into science formulas here. I'll give you a very simple definition: If it stinks – it's emissions. Harmful emissions. There are emissions that are so called "odorless", but that is a misleading concept because the body senses it one way or another. Yes, we have become numb to harmful, very hostile emissions. But see, a hungry yet healthy cat will not touch a spoiled fish, even if you can't smell anything "fishy". Old-school chefs will give a piece of the day's fish to the house cat. If the cat sniffs it but won't touch it, the fish goes to the garbage. Now if you would

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thoroughly cleanse your body and move to a very clean village up the mountains for a while, immediately after your return (for possibly a short while before you become numb again) you'll be able to sniff all those "odorless" harmful emissions! Standards of government-permissible emissions are way too high health-wise, they are hostile to life and we should not agree with those anymore!

Energy: The capacity to do mechanical (such as motion) or electrical work (such as heating).

Ethanol: Also known as ethyl alcohol, drinking alcohol or grain alcohol, is a flammable, colorless, slightly toxic chemical compound, and is best known as the alcohol found in alcoholic beverages. Produced today from corn as a common fuel additive, enforced on drivers across the USA and other locations as an "improvement" to gasoline. It is very bad both for gas economy of the individual AND to national economy, since its low energy efficiency requires us to import MORE petroleum for every gallon ethanol of we use. PER GALLON, IT HAS ONLY 2/3 OF THE ENERGY OF GASOLINE. Find all the (stinking) facts about ethanol by visiting www.zFacts.com

Farad (F): A unit of capacitance.

FE: Fuel Economy.

Free energy: Energy you did not have to pay for. It's a common concept that free energy is impossible. Yet if a paid-for instrument, or just a change of usage to an existing instrument brings you an energy or extra energy you don't have to pay for, then IN THE BOTTOM LINE or in other words after your cost has been paid for, then this is considered free energy. All 'free energy methods and devices are based on this same basic principle. Solar energy is one good example. Another example is water4Gas technology – our "free energy" comes simply and directly from REDUCTION OF WASTE. Since we have oceans of water, any energy derived CHEAPLY from water is considered free, economically speaking. If you have been conditioned to believe that free energy is not possible, change your thinking about it and you'll see many instances and opportunities of free energy.

Fuel cell: A device which produces electricity by using fuel (such as hydrogen) and a chemical which reacts with it at two electrical terminals, thus producing electric energy that can be used to drive a car or do other useful work.

Fuel efficiency: Defined by the amount of work (how much motion, in the case of cars, or how many hours of operation for a lawnmower or generator) can be obtained for the amount of fuel we put in. Commonly called 'Fuel Economy' and measured by miles per gallon or kilometers per litre.

Fuel: Any substance (liquid, solid or gas) that releases its stored heat energy and turns it into actual heat and motion energy, when treated in a certain way such as by burning or by combustion in an engine. When the fuel is burned it is destroyed and leaves us with problematic pollutants. In this regard (harmful by-products of fuel burning), water is not "fuel" because when "burned" it reverts back to water vapor and oxygen that feeds back into the atmosphere.

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Generator: A common misnomer for an electrolyzer, as in "hydrogen generator". When mentioned in Water4Gas literature, we refer to stationary engines that are used to convert gasoline to other types of energy, usually electricity.

Global warming: Gradual warming of a planet (in our case, Mother Earth) said to be due to the "greenhouse effect" of pollution in the atmosphere.

GP-7: An advanced fuel additive for 2-stroke engines, by Torco Racing Fuels, Inc.

GPH: Gallons Per Hour.

Green Gas: Another name for Brown's Gas.

GST: Gas Saving Technique for vehicles using WATER or Hydrogen-On-Demand. GST's are a set of methods, devices and additives all working together to maximize your fuel economy, while also minimizing harmful emissions resulting from poor engine design and inefficient use.

HHO: Hydrogen+Hydrogen+Oxygen. The product of splitting water (H2O) into its components. Common name for Brown's Gas.

HOD: Hydrogen On Demand. A system to generate hydrogen on board the vehicle without storing any of it.

Hydrocarbons: Fuels which, as the name implies, contain primarily hydrogen and carbon.

Hydrogen: The lightest and most abundant element. A gaseous diatomic element (in simple words: gas that always has particles in pairs). The atom consists of one proton and one electron.

Hydroxy: Another name for Brown's Gas.

ICE: Internal Combustion Engine. The most common type of engine in cars, trucks, boats, motorcycles, tractors, light airplanes, generators and lawn mowers for the past 200 years.

Ion: An atomic particle that is electrically charged, either negatively or positively.

Iron: The most widely used metal. Not very useful in its pure state since it rusts and is too soft; therefore we use it as part of steel -, in various combinations with carbon, nickel and other substances that enhance its durability and range of possible uses.

Joe Cell: Type of electrolyzer constructed of a series stainless steel tubing, one inside the other. Powerful yet relatively expensive and hard to replicate. Some people such as Bill Williams claimed to have run a vehicle exclusively on a Joe cell.

Knocking: Also called "pinging" - banging noise in the engine, caused by improper combustion.

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kWh: Kilowatt hour(s).

Lean (mixture): Less fuel and more air in the air/fuel mixture. In accordance with common wisdom (the "wisdom" of modern automakers) the mixture should be ideal at 14.7 parts air to 1 part gasoline. But in actual fact it can be as lean as 100:1 or more.

LED: Light Emitting Diode.

Lye: Sodium hydroxide, known as caustic soda. A strong solution of sodium or potassium hydroxide. Dangerous material used in making of hair relaxers and soaps. A common catalyst used in electrolyzers. Quite toxic, has user friendly alternatives.

MAF: Mass Air Flow. One of the inputs the ECU takes into consideration when determining the amount of fuel to be injected into the engine.

MAP sensor: Manifold Air Pressure sensor.

Methane: Natural gas or Compressed Natural Gas (CNG).

mH: mill Henry.

Mileage Seekers or MPG Seekers: Vehicle users of all walks of life who like to tinker with their vehicles, their driving habits – or both in many cases – in order to maximize fuel economy.

Mixture: Air-to-fuel ratio.

Molecule: Compound of two or more atoms, the smallest independent unit of chemical compounds.

MPG: Miles Per Gallon. The most common expression of fuel economy, the higher the better.

mV: milliVolts.

Naphtha: Am ambiguous term which may mean high flash naphtha (mineral spirits), or low flash naphtha (petroleum, ether, low boiling ligroin which is a refined hydrocarbon petroleum fraction used mainly as a laboratory solvent) or something altogether different. Flash point and explosive limits vary. The term naphtha is so ambiguous that it should not be used.

Neutral coasting; or just 'coasting': Fuel-saving technique of putting the vehicle in neutral to coast down a hill.

Neutron: One of the particles found in the nucleus of all atoms except hydrogen; considered to have no electrical charge but I suspect that this concept is going to change soon.

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nF: Nano-farad.

Nitrogen: An odorless, gaseous element that makes up 78% of the earth's atmosphere, and is a constituent of all living tissue. It is almost inert (limited in ability to react chemically) in its gaseous form.

NOx: Gases consisting of one molecule of nitrogen and varying numbers of oxygen molecules. Nitrogen oxides are produced in the emissions of vehicle exhausts and from power stations. In the atmosphere, nitrogen oxides can contribute to formation of photochemical ozone (smog), can impair visibility, and have health consequences; they are thus considered pollutants. [EPA]

Nuclear fission: Splitting atoms in a process that releases energy.

Nucleus: That part of an atom where the mass is concentrated (while the electrons are running like crazy around it). Contains protons, neutrons and table salt. No...just kidding... only protons and neutrons!

O2: Oxygen.

Octane rating: A number representing the ability of gasoline to control pre-detonation, in other words its anti-knock capability; not necessarily a better fuel for a certain job.

Odometer: Mileage or kilometer gauge.

OEM: Original Equipment Manufacturer.

On board: Mounted on (or in) a vehicle.

On-Board Diagnostics, or **OBD:** A generic term referring to a vehicle's self-diagnostic and reporting capability. OBD systems give the vehicle owner or a repair technician access to state of health information for various vehicle sub-systems. We refer to it as a generic term for the entire "program" running the vehicle, including its usage of energy in various conditions. While there are differences between vehicles, OBD-I generally refers to pre-1996 vehicles and the more advanced (and more pervasive) system OBD-II refers to models 1996 and newer. In models 2008 it is called CAN (see def.)

Orgone: The cosmic life force. The creative force in this universe. It comes from us living beings, not from stones and dead wood. It creates and controls everything else.

Over Unity, or **OU:** Trying to overcome the "unity" principle in which the energy we get out of a machine or process equals, in a perfect state, to the energy we feed into the machine or process. It is a misleading term because when we think of over-unity we tend to forget that a small match can light up a huge fire. When teachers and so-called "scientists" try to limit our scope of thinking into looking at the match as the only thing in the process, they are make us think that there is no connection between things, energies and living beings. The truth is that everything is connected,

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and also – this is not widely known – the true source of energy is living beings, not the physical universe. While I may store some old decaying energy, it's definitely not the source. OU is a limiting force in the energy research, and should be canceled.

Oxygen sensor or O2 sensor: An electronic device that measures the proportion of oxygen (O2) in the gas or liquid being analyzed. Used in science labs. In modern vehicles it is a small sensor inserted into the exhaust system to measure the concentration of oxygen remaining in the exhaust gas to allow an electronic control unit (ECU) to control the efficiency of the combustion process in the engine.

A side effect of oxygen sensors is that they can prevent fuel-saving technologies which create a lean fuel-air mixture from working. If the engine burns too lean due to any modifications (such as adding oxygen from an electrolyzer), the sensor will detect the mixture as being too lean, and the engine computer will adjust the injector pulse duration, so that the air-fuel mixture continues to stay within the stoichiometric (see def.) ratio of 14.7:1 on a typical vehicle. There are ways that the oxygen sensor can be overcome. Sometimes, a device can be inserted inline with the sensor, which tricks the engine computer into thinking the mixture is stoichiometric, when actually it is either rich, or lean, and therefore, this modification will not be automatically corrected by the oxygen sensor. [source: Wikipedia]

Oxygen: A non-metallic gaseous element that makes up 21% of the atmosphere.

Oxyhydrogen or oxy-hydrogen: Another name for Brown's Gas.

PCV valve: Positive Crankcase Ventilation valve, a one-way valve that ensures continual refreshment of the air inside a gasoline internal combustion engine's crankcase.

PCV: Positive Crankcase Ventilation, a system using a PCV valve (see Def.) to evacuate gases and moisture from the crankcase of an internal combustion engine.

Petrol: A mixture of various hydrocarbons used as a fuel.

pH (from potential of Hydrogen): A scale from 0 to 14, used for measuring acidity or alkalinity, where a number greater than 7 is more basic, less than 7 is more acidic - and 7 is neutral.

Ping or pinging: Also called "knocking" - banging noise in the engine, caused by improper combustion.

Proton: A positively charged particle, part of the nucleus of the atom.

PV: Photovoltaic; producing of electricity from light.

Renewable energy (**devices, sources)**: Energy from sources that cannot be used up because they always renew themselves: sunshine (solar collectors), wind (turbines), water motion (turbines hooked to a river, dam or ocean waves/tides). Some define it as any source of energy that has an entire life-and-regrowth cycle of up to a 100 years, such as cutting trees for energy.

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Rich (mixture): More fuel and less air in the air/fuel mixture. In accordance with common wisdom (the "wisdom" of modern automakers) the mixture should be ideal at 14.7 parts air to 1 part gasoline. But in actual fact it can be as lean as 100:1 or more. Therefore ANY number beyond the very minimum that is needed can be considered "rich". I know it's not "conventional wisdom" but in a decaying planet we must try to prevent ANY waste of energy, even a drop adds up to a river.

Rubber: A natural polymer (a polymer is a large organic molecule formed by combining many smaller molecules in a regular, repeated pattern). Rubber is a hydrocarbon and also a good insulator.

ScanGuage-II: The most popular scanner (see def.) between "mileage seekers" due to its ease of use and its capability to display instant or averaged MPG, between many other codes and vehicle conditions such as temperature.

Scanner: An electronic device, usually handheld, that reads and sometimes re-programs vehicle computer error codes.

Short (circuit): Electricity taking a "shortcut" due to a (greatly) reduced resistance than the proper path, resulting in very high (and uncontrolled) electrical current. Usually ends up in fire or severe damage.

Sodium hydroxide: NaOH, lye. A common catalyst used in electrolyzers. Quite toxic, has user friendly alternatives.

Solar cell/panel, Solar thermal energy systems: Devices, cells/panels or complete systems that converts solar energy (actually any light energy) into electrical energy.

Solar electricity: Electrical energy produced directly by solar cells/panels.

Solar heating: Methods and devices which derive and control heat directly from the sun. Such as a picnic solar cooker.

SPDT: Single Pole, Double Throw. Switch type that can switch one circuit (hence "single pole"), and is capable of making an electrical connection in each of its "throws" (sides of its motion).

Specific gravity: The ratio of the density of a material to the density of water (assigned a value of 1).

Spiral: a coiled shape, like the thread of a screw or like a coil spring. The difference between 'coil' and 'spiral' is that a coil can be winding upon itself, but a spiral is spread out through space. When an electric current is flowing in a spiral conductor (wire), it creates a magnetic vortex (rapidly spinning flow, like a whirlpool).

SSO: An advanced fuel additive for snow mobiles, by Torco Racing Fuels, Inc.

Steel: An alloy (combination of metals and/or minerals) which contains iron as the main constituent.

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Stoichiometric: Describing a (fuel/air) mixture of "proper" proportions. According to automotive conventional wisdom it should be 14.7:1 but in actual fact these are arbitrary numbers. A car can drive just as nicely on 25:1. In fact if you were to design it in a slightly different way, its so-called "Stoichiometric" balance would now be 25:1 (for example).

Suspension, suspended: A mixture in which fine particles are suspended in a fluid where they are supported by buoyancy (upward force on an immersed object). Solids neither dissolve in the liquid nor sink to the bottom.

Synergistic: The simultaneous action of separate things that have a greater total effect than the sum of their individual effect.

Synthetic: Man-made, not from natural sources. Actually we're using this word incorrectly when we speak about synthetic oils for example. Synthetic comes from synthesis, which means combining several sources into one product. Like a musical synthesizer that combines individual sounds to one music. So blending of corn oil and peanut oil could be called synthetic. But in the automotive industry today it is used to describe materials that are a combination of non-natural substances.

Thermal Runaway: Happens in electrolyzers refers to a situation where an increase in temperature changes the conditions in a way that causes a further increase in temperature leading to a destructive result.

Thermocouple: Two different pieces of metal, welded/bonded together. Electricity can be produced by heating one element and cooling the other.

Torco: A manufacturer of high quality motor oils and additives.

uF: A micro Farad. One millionth of a Farad.

VAC: Volts Alternating Current.

Vaporisation: The physical change of going from a solid or a liquid into a gaseous state.

Vaporizer: A device that adds water vapor to the air/fuel mixture of a vehicle's engine in order to boost its power, save gasoline and reduce harmful emissions.

VDC: Volts Direct Current.

Vested interest: Individuals or groups who stand to gain - usually financially - from some policy, often a public policy.

Voltage offset: Voltage added to the output signal of the oxygen sensor. The combined signal (with the offest) is fed back to the ECU.

Voltage: Measure of electrical tension or pressure. The unit is Volt, named after the Italian physicist Alessandro Volta.

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Water Gas, watergas, waterfuel: Yet more names for Brown's Gas.

Water: An oxide (chemical bond with oxygen) of hydrogen. One of the most abundant compounds on Earth. In its pure state such as distilled water, it does not conduct electricity; but with a little help from a catalyst can be be electrolyzed (separated) into hydrogen and oxygen.

Water4Gas: A combined technology to convert water to energy. Consists of a electrolyzer (or several electrolyzer cells) installed on board a vehicle or any other ICE (see def.), plus a set of fuel economy enhancers, fuel additives and other techniques.

Watt-hour: a unit of work. A simple multiplication of the number of Watt (which expresses how many electrons in a given unit of time) by the number of hours that this number of Watts is applied. Or, in the case of a battery, how many hours can the battery provide those Watts before it's depleted.

Watts: A unit of electrical power; not potential power (voltage) but actual work done. To find the "wattage" or in a simple word electrical Power, multiply Volts by Amps. Named after Scottish engineer and inventor James Watt.

WFC: Water Fuel Cell. Common name for electrolyzer.

Wind machines/turbines: Machines or devices powered by the wind which produce mechanical or electrical power**.** A popular renewable energy (see def.) because it can be utilized cheaply by anyone who lives in a windy area.

Xylene: Most will say it is a paint thinner. But FireNet International (UK) says it is actually part of gasoline: their glossary defines Xylene as "Dimethylbenzene. An aromatic compound having the formula C6H4(CH3)2. Xylene is a major component of gasoline."

Zero Point Energy (ZPE): In physics, the zero-point energy is the lowest possible energy that a quantum mechanical physical system may possess and is the energy of the ground state of the system [the energy left in a system when the temperature is reduced to absolute zero (0 Kelvin -2730 Celsius)].

The concept of zero-point energy was proposed by Albert Einstein and Otto Stern in 1913, which they originally called "residual energy" or Nullpunktsenergie [German for Zero-point energy]. All quantum mechanical systems have a zero point energy. The term arises commonly in reference to the ground state of the quantum harmonic oscillator and its null oscillations.

In quantum field theory, it is a synonym for the vacuum energy, an amount of energy associated with the vacuum of empty space. In cosmology, the vacuum energy is taken to be the origin of the cosmological constant.

Because zero point energy is the lowest possible energy a system can have, this energy cannot be removed from the system. A related term is zero-point field, which is the lowest energy state of a field, i.e. its ground state, which is non zero.

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Despite the definition, the concept of zero-point energy, and the hint of a possibility of extracting "free energy" from the vacuum, has attracted the attention of many inventors. Numerous perpetual motion and other devices, often called free energy devices, exploiting the idea, have been proposed. As a result of this activity, and its intriguing theoretical explanation, it has taken on a life of its own in popular culture, appearing in science fiction books, games and movies.

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